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The Mining Journal

LONDON, DECEMBER 30, 1960

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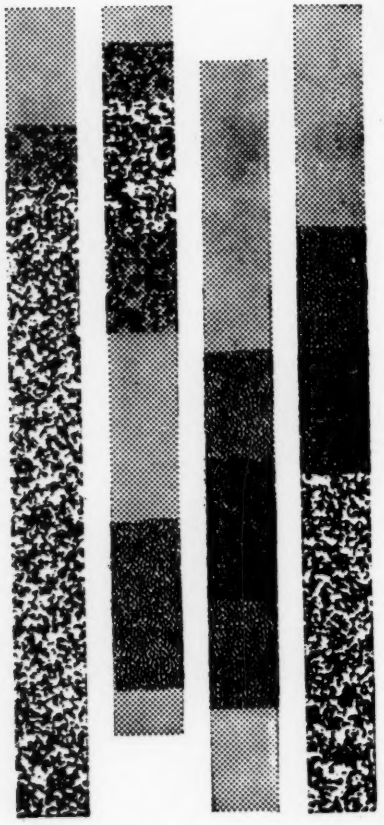

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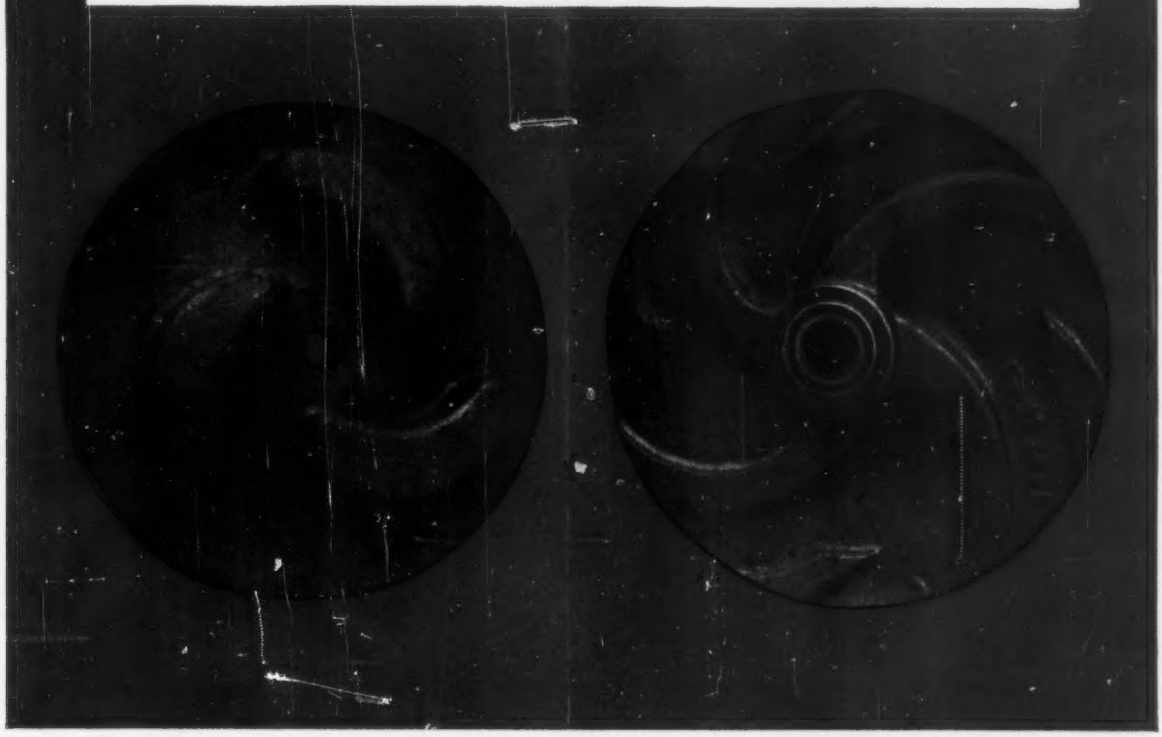

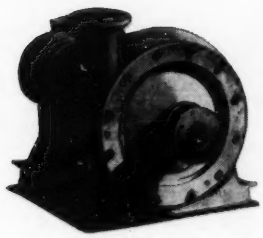

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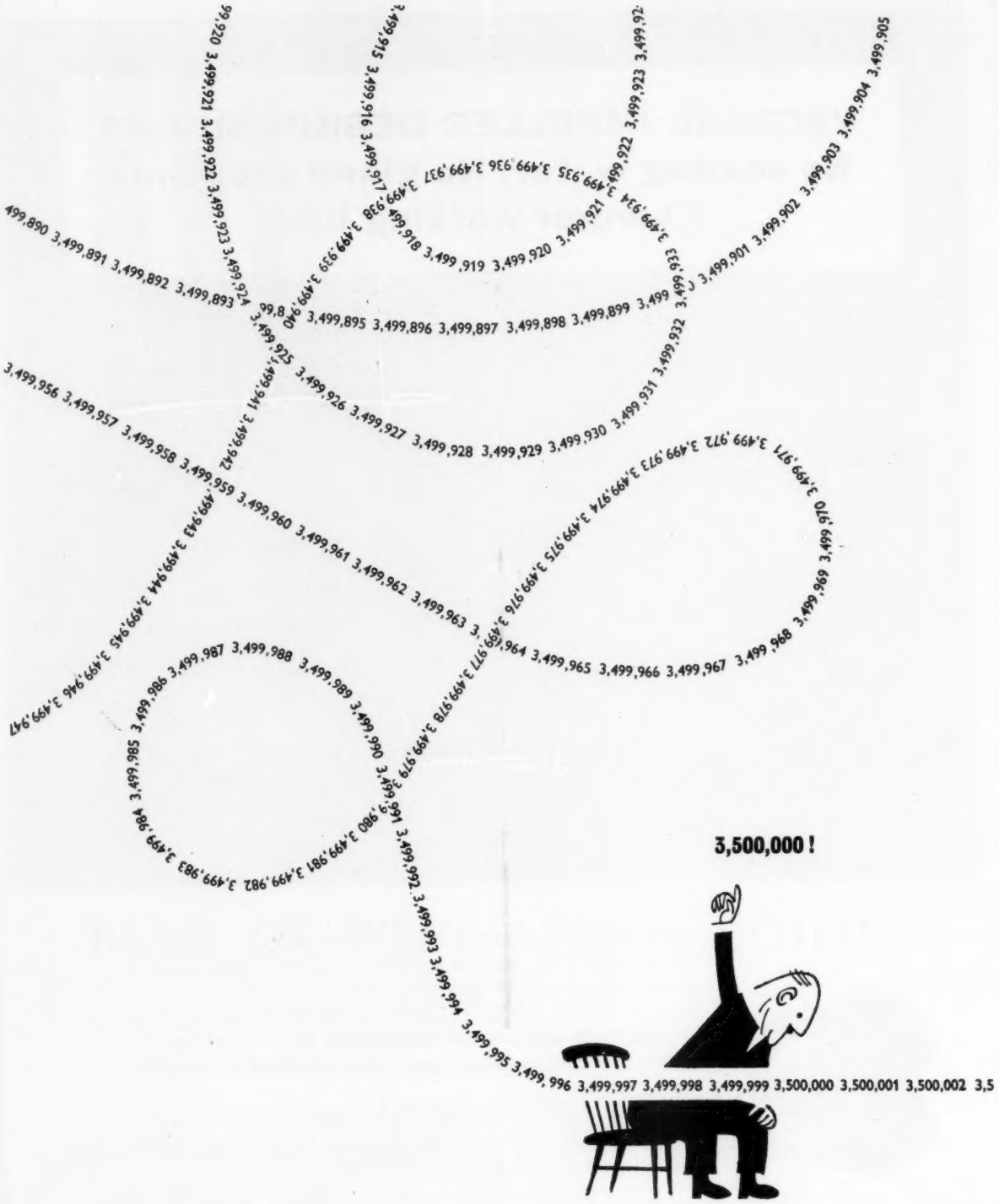

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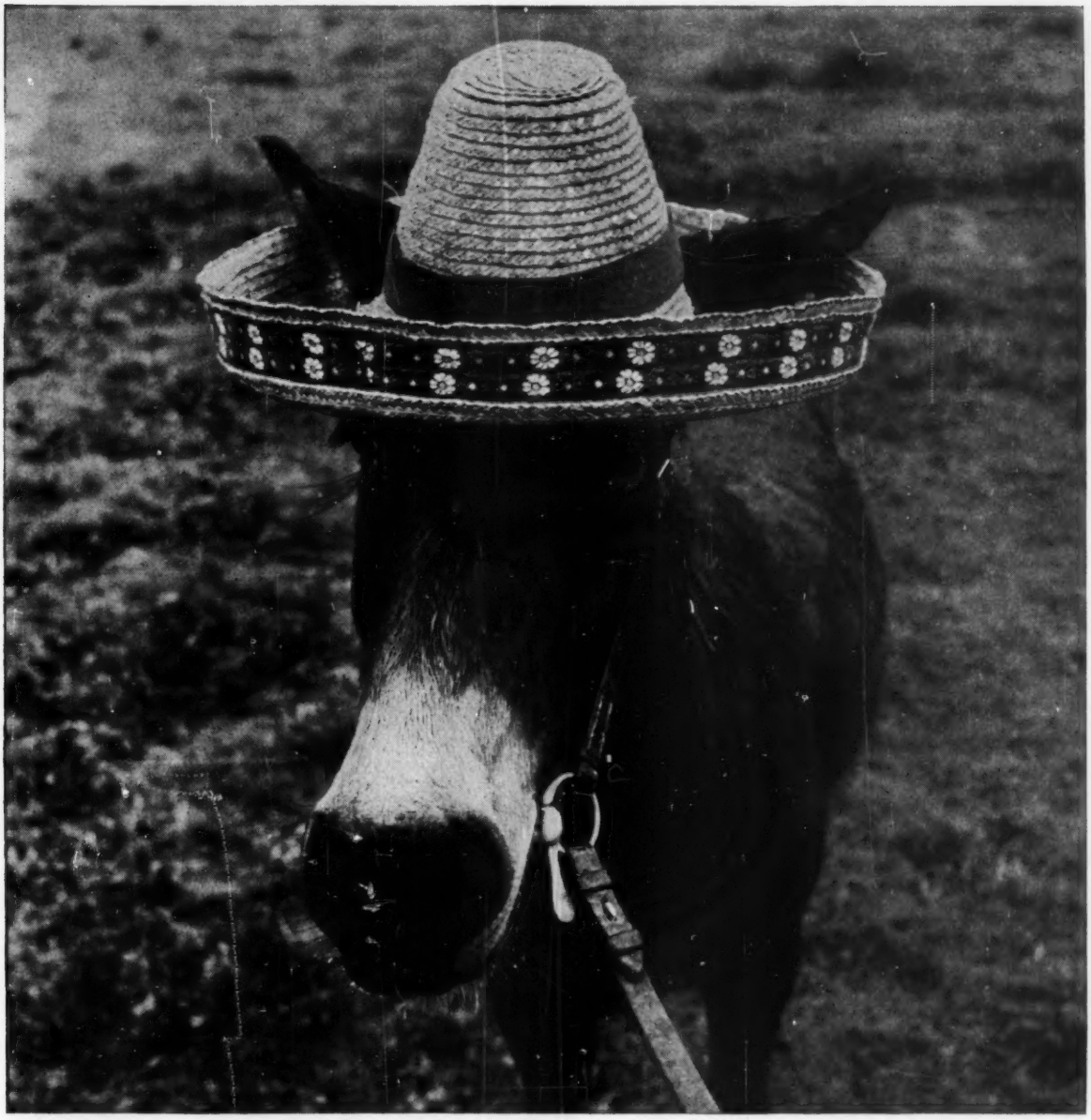

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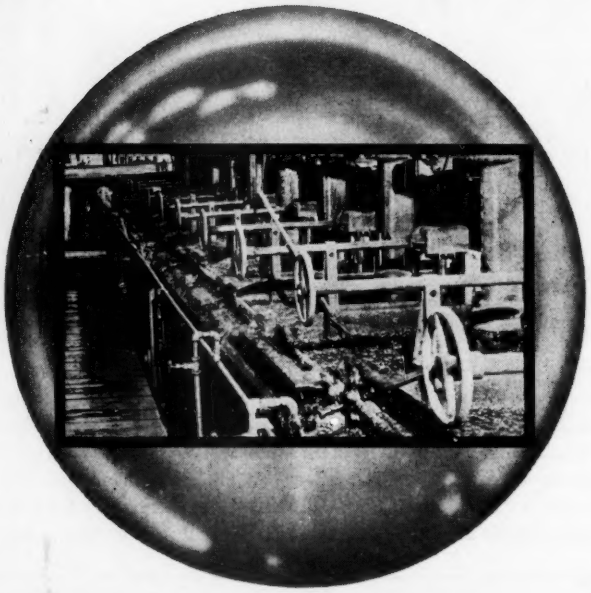

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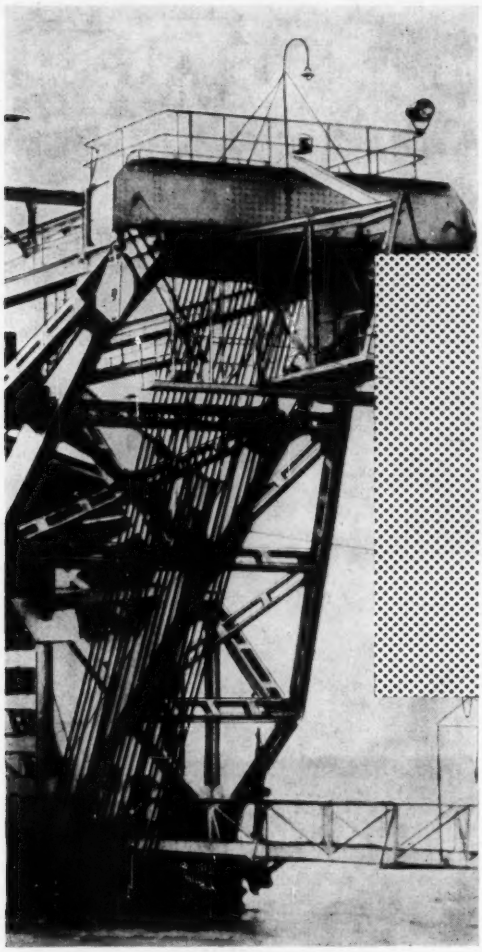

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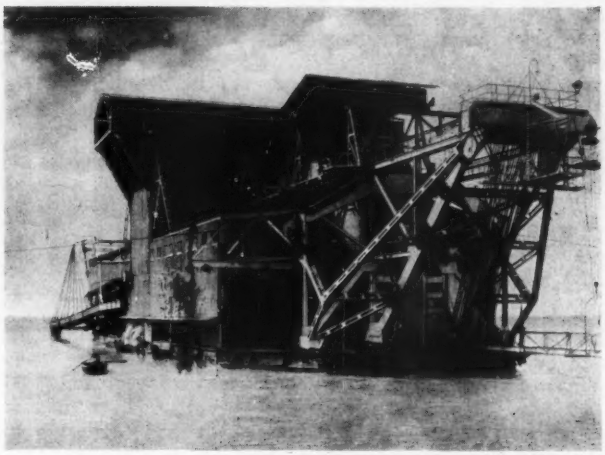

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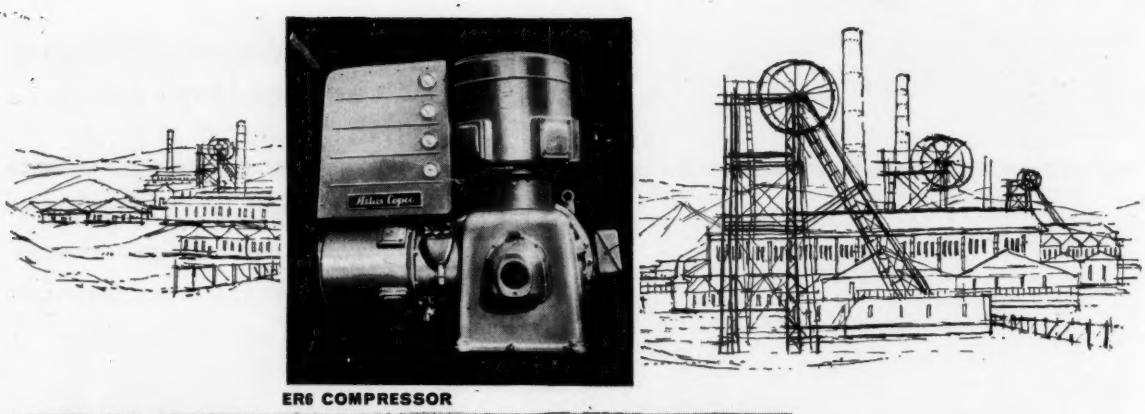

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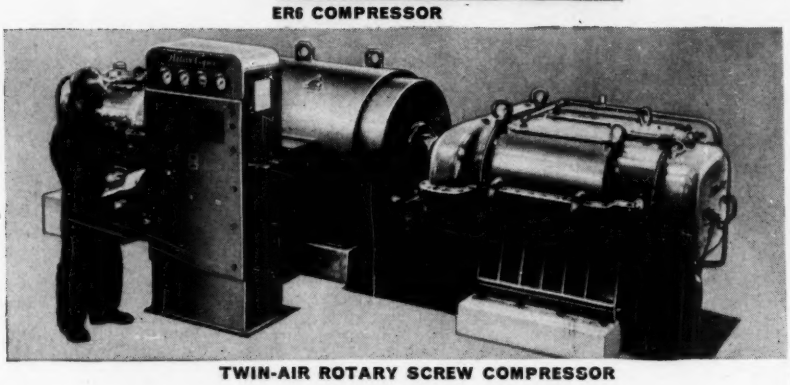

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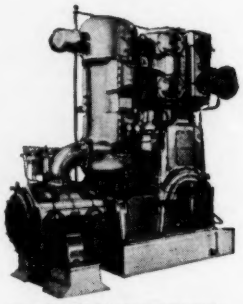

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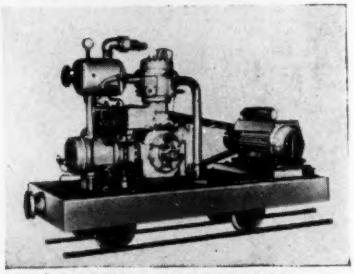

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The Mining Journal

London, December 30, 1960

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Disincentive in the Wrong Places

THIS is going to be about sin. We hope to show that like the preacher in the anecdote we are against it. In particular we are against the political sins of omission in the sphere of Britain's overseas trade, which flow from a governmental confusion of *laissez faire* with *laissez aller* and a rooted disinclination to establish a precedent even where to adopt a solution short of the ideal would be less harmful than to do nothing.

The impulse to return yet again to this distasteful subject, for which we shall doubtless be castigated, is provided by Mr. Val Duncan's uncompromising remarks in his presidential address of last week to the annual general meeting of the British Overseas Mining Association. However, as his statement is reported on page 748 and as all we are about to say we have at various times said before, and more especially as it is Christmas, we shall endeavour to keep an otherwise interminable and depressing recital within bounds by in some instances doing little more than allude to the various disincentives which still beset British overseas mining and its associated activities.

For the benefit of new readers and for old readers wishing at this festive season to recapture the full gloom of the present prospect a selective bibliography listing some of *The Mining Journal's* more detailed contributions to these problems is appended on page 732.

In any country, national fiscal policy performs two functions. First it finances the public sector of the economy. Second it provides graduated incentives (or disincentives) for the whole range of the country's economic activity, both domestic and in its relations with the rest of the world. It is, however, not so many decades since the spirit of *laissez fairé* in British government was such that the deliberate use of fiscal policy for this second purpose was barely perceptible. Indeed the miner might be excused for asking how far we have in fact progressed in the interval.

The fact remains that two world wars, separated by a world slump finds us today, whether with a government of the right or the left, equipped with a whole paraphernalia of subsidies, tariffs, purchase taxes, capital depreciation allowances, D.T.R. agreements and, lastly and of recent date, reliefs for O.T.C.'s which are as yet limited in their range of application and consequently in their effectiveness.

It is thus clear that the principle of using tax legislation as the means of prompting the main changes of pace and emphasis in the private sector in line with the changing priorities of the national interest has been granted full *de facto* recognition by both our major political parties. This use of the tax system is indeed common to almost every country with a free economy, but somehow in Britain's hands its application has seemed more tentative and unimaginative than elsewhere.

Nowhere has this been more true than in the handling by successive British governments of those political and economic problems which impinge upon our overseas mining interests. Partly these problems reflect our overriding need to expand exports wherever possible. Partly they reflect the equally urgent need in the context of the Cold War to provide financial and technical aid for the underdeveloped and as yet politically uncommitted areas of the world, which in the earliest stages of developing their foreign exchange income so often can only turn to the exploitation of their mineral resources.

In all this, Britain must clearly have three main objectives. First she must maximize her overseas investments, whether from the private or public sectors, in those countries where these investments will prove the most rewarding both politically and commercially. Secondly, she must maximize her export both of technical know-how and of mining equipment and consumable stores. Thirdly, she must ensure for British industry the long term availability at stable and competitive prices of our huge and varied requirements of imported metals and minerals.

On all these counts there has never in modern times been a British government which has shown a true awareness of the problems involved, still less any determination to tackle them resolutely. Nor is this a matter of political idealogy as, despite their greater inclination towards national planning, Labour governments have been as insensitive as have their Conservative successors. Nor, with the example of the shipbuilding industry before us, can it be argued that to accord a special tax status to overseas mining would be to create a politically unjustifiable precedent.

Admittedly by their very complexity the problems of minerals economics and of the consequential policies of government and industry constitute an area of policy making wherein there is seldom one obviously "right" solution, so that any policy must at best represent a reconciliation of conflicting interests and of policies in other related spheres. Yet, largely because of this, the governments of practically every major industrial power except Britain have at their disposal in one form or another, agencies (of which perhaps the U.S. Bureau of Mines provides the most eminent example), which apart from performing important executive functions also provide their governments with the intelligence services relating to mining throughout the world which are indispensable to policy making.

Indicative of the British attitude to these problems is that there is no one identifiable government Minister responsible for taking an overall view of the problems involved nor, if he existed, would he have any adequate source of minerals intelligence to which he could turn either for briefing or for the detailed work of policy making. To argue, as some people do, that because we have no metal mining to speak of in Britain there is therefore no need for us to have a mineral resources policy, is rather like saying that because London has no parking space it has no need for a traffic policy.

To be fair, however, it must be added that it has yet to be seen to what extent and in what directions all these shortcomings will be taken into account in connection with the examination, which the Government has currently in hand, into the possibility of creating a Department which would bring together under a single direction all forms of British technical and advisory assistance for overseas territories, whatever their political status, and which, it is proposed, should be jointly responsible to the Colonial Office, the C.R.O. and the Foreign Office. This initiative, announced by Mr. Macleod in the House of Commons on December 19, could be of the greatest importance to the British mining interest overseas. We venture to suggest that it rests with such bodies as the British Overseas Mining Association, the Institution of Mining and Metallurgy (which held a Symposium on Mineral Resources Policy as long ago as 1955) and the recently formed British Mining Equipment Export Association to ensure that in fact it does become so.

It is clear that when addressing the British Overseas Mining Association, many of these thoughts were in Mr. Val Duncan's mind. B.O.M.A. has throughout its life devoted the greater part of its efforts to endeavouring to improve the domestic fiscal climate, so that British domiciled companies and British investors engaged in mining overseas should receive treatment which would give due recognition to the risks and special forms of depreciation inherent in mining, and which would enable Brtish citizens engaged in this overseas activity, so vital to our welfare, at least to operate at no disadvantage in competition with those from other countries whose governments recognize and make provision for the peculiarities of mining investment.

Although the Budget for 1957 went some way, with the introduction of O.T.C.'s, towards meeting B.O.M.A.'s difficulties, there were a number of crucial shortcomings in the O.T.C. legislation as applied to mining, which nothing has since been done to remedy. We examine the precise nature of these in a separate article on page 735.

The three most notable shortcomings are first that a U.K. mining company enjoys none of the benefits from pioneer reliefs granted by countries in which it may be operating.

BIBLIOGRAPHY

THE POLITICAL AND ECONOMIC NEED FOR A BRITISH MINERAL RESOURCES POLICY.

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Also relevant to the above subjects are the lead articles in the M.J. Annual Review *editions over the past five years.*

Second, a non-resident overseas subsidiary company cannot qualify as an O.T.C., so that even where a U.K. parent company is "not carrying on trade in the U.K.", it cannot transfer profits from one such subsidiary to another in a different overseas territory without liability to U.K. tax.

Third, such benefits as a U.K. company does derive from O.T.C. legislation become taxable in full in the hands of its shareholders.

Thus, to take the extreme example of Lake View & Star quoted here a fortnight ago, it is possible for a British domiciled company, mining gold in Australia, to enjoy full tax exemption in Australia both in respect of the company and in respect of minority Australian shareholders, while a large part of these benefits, as they affect distributed profits in the hands of U.K. shareholders, are appropriated by the British Government. At the same time, the Australian Government which has deliberately created a climate of incentive for the development of its gold industry, finds the impact of this incentive largely nullified so far as the British investor is concerned.

The U.K. overseas mining industry has in the past done much to develop mining in Australia and the other older countries of the Commonwealth, where today flourishing mining industries exist and investment is relatively safe. These are, in a sense, the emergent countries of yesterday, but we must think also of the economically emergent countries of today where Britain is fast losing the initiative in the stimulation of mining, not from any failure of personnel or know-how but through the inhibitions on investment in the private sector caused on the one hand by our tax laws and on the other by emergent nationalism.

In the latter context the fact that a U.K. domiciled mining company should be deprived of tax benefits offered by the host country is of rapidly diminishing importance, because O.T.C. status in its present form is largely irrelevant for the future, since on political considerations alone we are unlikely to see many more British registered overseas mining companies. This emphasizes the basic misconception of O.T.C. legislation in its present form—namely that it concerns only British registered companies.

In any event, what is of much greater concern is the fact that the British resident investor receives none of the benefits available to mining investors in many other countries which recognize that, in order to attract risk capital to mining in competition with other investment outlets, incentives to individual investors are no less necessary than to the companies themselves. Thus side by side with the total tax exemption granted, as we have seen, to Australia's gold mining investors and also the partial exemption granted for the mining of copper and a long list of other ores, we find, to quote but another example, that in Canada shareholders are given a depletion allowance of between 10 and 20 per cent of the dividend in addition to that given by the company.

So long as this situation obtains it is not to be wondered at if the governments of host countries show a preference for granting mineral rights to mining companies financed by shareholders from countries other than Britain, whose tax laws do not nullify the effect of incentives designed to offset mining's special risks and depreciations.

Aside from the purely tax aspect of the matter Mr. Duncan underlines in his B.O.M.A. speech the broader issues involved, namely the increasing urgency which all countries of the West are attaching to the development of under-developed territories and the growing political risk inherent in operating in many of these countries where today's welcome may turn to tomorrow's sequestration.

Against this background the responsibilities of a British overseas mining company are diverse and not infrequently in conflict. In addition to its primary obligations to its shareholders, its employees and its customers, a mining company operating in Colonial territories or in newly emergent States is confronted with a whole range of political, financial, educational and social problems which would come more easily to those trained in the Colonial Service than in the arts and sciences of mining. Nevertheless these are the day-to-day problems which many British overseas mining companies have to take in their stride and in fact do so with distinction. The vital role which British mining know-how and capital has it in its power to play is underlined by the very speed with which the advance to independence is occurring in so many countries and which is forcing upon the governments of these emergent countries the need to rely heavily on financial aid and administrative and technical guidance wherever they can find it.

As matters stand at present, the know-how must come largely from the mining groups, as the ranks of Britain's independent mining consultants are now sadly depleted, in part by the lack of British funds for survey finance and in part by the continued disinclination in Britain to subsidize the mining consultant on contracts in under-developed territories in competition with consultants from other countries, who are all seemingly enabled by one means or another to quote whatever uneconomic fee the traffic will bear.

Aside from the lack of encouragement from successive Chancellors to British investors and mining companies operating overseas, it has to be recognized that in many emergent countries the political, and in some cases the fiscal, climate is inimical to risk capital. Yet in the competitive political climate engendered by the Cold War, the primary producing countries are progressively raising their planning targets confident that one way or another the money will be forthcoming for their economic developments. This confidence seems likely to prove fully justified, especially as, with the reconstruction of their own economies virtually completed, the industrial countries of the West are in a position to play a more active role in providing capital for the under-developed areas. Moreover, economically no less than politically, it is undoubtedly in their interests to do so in order to ensure expanding markets for their own manufactured products and in the longer term to secure the availability of the mineral needs of their industries at stable market prices.

The astronomical capital sums which will in the aggregate be required, will of course continue in a substantial measure to come from aid funds, that is to say from the taxpayer. Yet public funds can never be enough and in any case the proportion of aid funds which has so far found its way into mining has been small. However, the greater the flow of private investment to the under-developed territories, the less heavily will the overburdened taxpayer be loaded with the steadily rising cost of financial aid. Yet in recent years the private investor's contribution, aside from the oil industry, has been almost negligible at a time when there is certainly no lack of private funds seeking profitable use at diminishing yields in British equities.

With the examples of such countries as Bolivia, Egypt, Indonesia, Cuba and the Congo so keenly in the investor's mind this is not to be wondered at, and there seems to be no practical solution to this problem other than through the establishment, either nationally or through some international agency, of machinery for underwriting the private investor against the political risks of investment in many of the emergent States.

Admittedly the taxpayer would still be carrying the eventual loss on private investment projects which

suffered extortion or expropriation, but in so doing he would merely be footing a bill which he would otherwise have had to face at an earlier date in the form of a government or international agency loan. At the same time the taxpayer would be avoiding all expenditure on a much larger number of other successful projects for which, by shouldering the political risks, he had stimulated private enterprise to play its part.

To state this proposition at its lowest, the funds which Western governments are prepared to make available in the taxpayer's name for projects in under-developed territories could through an insurance scheme of this sort in fact support an infinitely larger capital fund from the private sectors of the economies of Western countries. Nor is this a matter which need wait for international agreement. Already there have been indications that private U.S. investors in the development of iron ore in Liberia may be underwritten by the I.C.A. Is this concept going to prove yet another loss opportunity in Britain's foreign affairs?

AFRICA THROUGH A BANKER'S EYES

There can be few commercial organizations more universally associated with the economic progress of the Commonwealth than Barclays Bank D.C.O. which now operates 1,239 branches in 41 different countries, the great majority of which are Commonwealth members. The bank's widening activities have made a contribution of growing importance to the economic development of this diversity of countries, many of which are situated in Africa. It was to be expected, therefore, that in his annual statement to shareholders the chairman, Mr. Julian Stanley Crossley, should have devoted particular attention to the many constitutional changes and political upheavals which have taken place in African territories during the past year. The Bank's intimate knowledge of local needs and problems places Mr. Crossley in a position to view political developments in perspective against an economic background, which in many instances is one of rising prosperity. In his thoughtful and timely address he dispels a number of misconceptions. There is no justification, he considers, for the extremes of pessimism, even though there may be setbacks and shocks in plenty in the years immediately ahead.

As the statement points out, Africa is a vast continent, peopled by many races with widely differing backgrounds. To group together their needs and aspirations, their troubles and growing pains, labelling the whole "the African problem," is to over-simplify. Those who still insist on thinking of Africa as an indivisible whole are apt to assume, from the collapse which followed the abrupt termination of Belgian rule in the Congo, that chaotic conditions must inevitably accompany the granting of independence elsewhere. Notable examples to the contrary, and the remarkable steadiness and good sense shown by many of the newly emergent states in recent months, are frequently overlooked.

Mr. Crossley believes that there is no real danger of the Congo's tragic experience being repeated in British territories, if for no other reason than that the training and preparation already given have provided safeguards. Nevertheless, the events in the Congo have starkly revealed the consequences of an almost total lack of preparation for self-government and, at the same time, have proved that political guile and persuasive oratory are not effective substitutes. If this should be disillusioning for extremists and if it should give place to moderating influences, good may result. If continuity of efficient administration is to be ensured, all the governments which now have responsibility for the "British" territories must be resolved not to yield to popular clamour. Changes, in Mr. Crossley's view, must be carried out in an orderly manner; they cannot be rushed without the risk of a total collapse.

Another point emphasized in the statement is that political developments, however spectacular, should not be allowed to obscure the background of progressive work that is, all the time, going on in other fields in these new countries. In West Africa, for example, the remarkable efforts put into the building of the great Universities of Legon in Ghana and Ibadan in Nigeria, and also into the development work on the oilfields, are of great significance for the future. Long after the political leaders today and their slogans are gone and forgotten, the Zambezi will be harnessed to the needs of man.

Mr. Crossley has no doubt that rapid economic progress will continue in many of the new countries in Africa and elsewhere, and in some of them at an increasing rate, despite political tension. One feature that all seem to have in common is the desire for prosperity and progress, with its accompanying hunger for capital. There are abundant signs that, among the industrialized countries of the world, a recognition of this need and of its urgency, is growing. To this immense work Barclays and other banks are making an invaluable contribution by creating a broadly based banking system which, having the principle of decentralization ingrained in its structure, is able to adapt itself readily to local requirements while retaining the necessary overall co-ordination of its work.

One of the most significant trends in the company's business during the year was the continued demand for advances. Lendings increased by £53,000,000 and have now reached the record figure of £301,000,000. In addition, Barclays Overseas Development Corporation Ltd. has now put out a total of over £22,000,000 in the form of loans or investments which could not properly have been undertaken by the Bank.

DRY DRILLING FOR MICA BANNED

The Factory Inspectorate of Bihar, India, has been devoting attention to the problems of health hazards in different industrial occupations, consideration being given in the first instance to silicosis. Two industries, namely, mica mining and the manufacture refractories, were studied, as these two involve workers in maximum contact with silica dust. Since Chotanagpur supplies practically the entire exportable mica, the whole of it being mined in the Kodarma and Giridih areas, this study was of great importance.

Mica in Chotanagpur is found in pegmatites, embedded in schists, and on the layers separating quartzites and felspars. Samples taken from rock drillings in these mines gave the presence of free silica ranging from a minimum of 11 per cent to a maximum of 67 per cent with a medium of 42 per cent. The study revealed that the operation in which workers were exposed to the maximum concentration of silica dust was drilling. Though the general air had 3.8 p.p.m. per cu. ft., the figure increased to 1,000 while using a pneumatic drill on dry rock. Significantly, the highest percentage of silicosis was among drillers (44 per cent) whereas all the other occupations taken together gave only about 25 per cent. The final findings were that 34 per cent of the miners had nodular and conglomerate silicosis. In India the figure is ten times that of the United States where the figure was called "high".

Dry drilling has, therefore, now been banned and all drilling now must be with a wet drill.

A PRIMARY DISINCENTIVE TO BRITISH INVESTMENT IN MINING OVERSEAS

THE principal aspects of U.K. taxation which mining companies wish to improve are concerned with :

1. the restrictive effect of present O.T.C. legislation in regard to free use of funds within a group;
2. the frustration of Pioneer Industries Reliefs granted in overseas countries by failure of the U.K. authorities to enable this relief
   (a) to benefit the U.K. company
   (b) to be passed on to individual shareholders;
3. the difficulties and delays in the case of overseas operations arising from the operation of Section 468, Income Tax Act, 1952, which concerns the necessity to obtain Treasury consent for the creation and issue of capital, transfer of trade or residence, and certain transfers of shares.

O.T.C. Legislation

To obtain the benefits of qualification as an Overseas Trade Corporation, a company has to be managed and controlled in the United Kingdom as well as carrying on its trade wholly overseas. These benefits are exemption of profits from U.K. Income Tax until distributed to shareholders or loaned to an associated company, and exemption from Profits Tax in the operating company. By enabling one O.T.C. to reclaim tax suffered by another O.T.C. in the same group on inter-company dividends and loans, profits can be circulated within a group so that they may be used wherever it is in the interest of the group as a whole to expand.

The Report of the Royal Commission on the Taxation of Profits and Income envisaged the O.T.C. legislation applying to overseas subsidiary companies, whether controlled from the U.K. or outside it, but the legislation, which has now been in force for over three years, did not cover companies controlled outside the U.K.

In a group where control and management has been decentralized to the overseas subsidiaries, flexibility in the use of funds does not exist to the same extent as in the case of O.T.C.'s. This is particularly so where there are overseas minority shareholders.

The minority shareholders may wish to receive a dividend when the U.K. parent company might find it inconvenient to pay one, as an overseas dividend is liable to U.K. taxation when declared, whether remitted to the U.K. or not. On the other hand, if the minority shareholders receive no dividend, they are likely to object to the loan of funds direct to another overseas subsidiary of the parent company.

If the profits of these overseas companies could be brought within the O.T.C. provisions, greater operating flexibility could well result. The implementation of the full scheme contemplated by the Royal Commission is now being sought by the British Overseas Mining Association.

A further restrictive condition regarding O.T.C.'s is that a holding company O.T.C. must not have a U.K. subsidiary which is not itself an O.T.C. Moreover, in view of the large amounts of money required to bring a mine into production, it is a disadvantage to the mining industry that, to qualify as a subsidiary for O.T.C. purposes, over 50 per cent direct or indirect beneficial interest in the ordinary capital is required. In Canada, on the other hand, a holding of 25 per cent or more in a non-resident company entitles the Canadian holding company to exemption from Canadian tax on dividends received from the non-resident.

Pioneer Industries Reliefs

The position under U.K. tax law compares unfavourably with, for example, Australia, where the full exemption granted in respect of mining gold and uranium, and the limited exemption in the case of mining for copper and other ores, are passed on to the individual shareholders.

In Canada, shareholders in mining companies are given a depletion allowance of between 10 per cent and 20 per cent of the dividend, in addition to that given to the company.

The Royal Commission recognized that arrangements should be devised to give a U.K. company deriving overseas income the benefit of any pioneer reliefs granted by the overseas country, but it was not prepared to recommend that such reliefs should be passed on to individual shareholders.

The Commission proposed that relief to the company should be in the form of a notional double taxation relief in respect of tax which the overseas country might certify to have been relieved by pioneer reliefs. For this purpose, it is proposed that the U.K. Government should enter into special arrangements with other countries, and recommended that there should be a list of specified headings for concessions : e.g., tax holidays, accelerated depreciation allowance, etc., which the U.K. Government would control and would be empowered to add to, amend or reduce at its discretion. By this means, it would maintain some control over the kind of concession that it was furthering, as the decision in the first place as to which industries would benefit and in what way would be made by the overseas government concerned.

In the meantime, resentment is growing in overseas countries at the frustration of their own special tax reliefs to mining through the operation of the U.K. tax laws. In Rhodesia, for example, depletion allowances are granted only if corresponding relief is given in the country of residence of the company mining in Rhodesia.

Section 468

Although Section 468 contains very wide requirements to obtain Treasury consent for transactions relating to the creation or issue of share capital or debentures by overseas subsidiaries, the transfer of residence of a company from the U.K., the transfer of the whole or part of a U.K. company's trade to a non-resident, and the transfer of shares in a non-resident subsidiary, the procedure in practice is not so onerous.

The Treasury has issued particulars of five General Consents and, if the proposed transaction clearly falls under one of these headings, no application for Treasury consent is necessary.

Under present conditions, it appears that consent for any proposed transaction for which a reasonable case can be put forward is unlikely to be refused by the Treasury.

The main objection to Section 468 therefore is the delay caused by making applications which are most unlikely to be turned down. Where it is a question of an overseas subsidiary making a purchase bid, and the overseas company is not in a position to finalize its offer until Treasury consent has been obtained, market conditions may change in the meantime and thus affect the whole basis of the offer.

Russian Copper Reserves

IT is estimated that by 1965 Russia's consumption of copper and copper-zinc alloys will have almost doubled. Under the present Seven-Year Plan (1959-1965), it is proposed to raise annual production of copper to 800,000 tonnes from the 1958 figure of 435,000 tonnes. A survey of present sources of copper in Russia has been published in Germany recently by a body concerned with Eastern European research, the German Society for Eastern Studies.

Four main types of copper-bearing minerals are found in the Soviet Union, states the report, total reserves being composed of them in almost equal proportion. They are: copper-pyrite ores; weak copper-pyrite impregnations combined with acidic surface-igneous rock; copper-bearing sandstone; and copper-nickel-cobalt ores combined with metals of the platinum group. The main copper-mining area is still the mineral-rich Soviet republic of Kazakhstan.

The source of this article is a survey published by the German Society for Eastern Studies, a body concerned with Eastern European research

Jeskesgan Deposits The Largest

The biggest deposits in the Kazakhstan area are those at Jeskesgan, some 315 miles south-west of Karaganda. The Jeskesgan deposits, which contain copper pyrites, bornite, copper glance and other minerals, is of the same structure as the Rhodesian Copperbelt, though of lower grade. Metal content is set at 1.62 per cent. The last estimate, which stated that some 3,511,600 tonnes of metal content were situated in this deposit, is now far too modest.

Despite the size of the Jeskesgan deposits, priority has been given over their exploitation to that of the poorer reserves in the Kounrad area. This is due probably to the better transport facilities which exist for their distribution, Kounrad lying near the navigable Lake Balshash. The porphyry copper ores deposited there have an extremely low metal content, and only the transport facilities, the considerable dimensions of the deposits and the ability to mine by opencast methods make exploitation economic. Such ores as are exploited at Kounrad bear about 1 per cent copper and metal content of the reserves is believed to be in the region of 2,000,000 tonnes. An on-the-site copper plant has an annual capacity of 100,000 tons. The deposits are made more valuable by the existence of small, but extractable quantities of molybdenum, gold and silver.

In northern Kazakhstan, the Boshtshekul copper reserves contain a further 1,500,000 tonnes of copper contained in poor ore; it is not known whether these deposits are exploited. Other main deposits in Kazakhstan are at Uspenskoye, Maikain and at Mangys-Tan, on the Mangyshlak peninsula. In the Altai region, the Russian lead-zinc centre, copper pyrites, pyrites and mixed deposits with copper content are also located, as at Talovskoye, Lasurskoye and Chudak.

Much stress is now being laid on Siberia in Russia's copper economy. What are called "very great reserves" of copper minerals have recently been found in the Sayan mountains and in the Chita province of eastern Siberia, though no further details are available of these. Apart from the new deposits, in which copper occurs together with nickel, cobalt and arsenic, Siberia contains known sites of considerable importance in the Gorni Altai, the Tuva area and in West Sayan, where the copper-bearing ores contain cobalt arsenides and nickel arsenides and in some instances have a considerable silver content. Many deposits have been located in the West Siberian mountains and between this range and the Sayan mountains are a number of reserves of copper-bearing sandstone, this consisting mostly of copper glance combined with malachite, as well as chrysokoll and bornite. These reserves—including those at Pechishchi, Raisinskoye and Sarabogolsk—are of little value despite their size, since they contain little copper and are positioned irregularly.

In Polar regions are copper deposits on the East Yennisei Plateau and in the Norilsk region, famous for its platinum, on the Lower Yennisei. Primary ores here have a relatively high metal content, though the quantities of copper pyrites, pentlandite and platinum contained vary to a large extent. High copper-content minerals are also located in a secondary sulphidic zone. The low temperatures, frozen ground and isolation of the sites is a great disadvantage. Big copper-bearing sandstone deposits exist on the Upper Lena in Eastern Siberia. Deposits occur over some 500 miles. Copper exists also in Transbaikalia, north east Siberia, the Siberian Chita deposits being considered as Russia's greatest potential resources.

The Ural Ores

Estimates made in 1950 state that some 246,000,000 tonnes of copper-bearing ore containing 4,000,000 tonnes of metal is located in the Urals. Most Ural copper ores are of copper-pyrites grouped in lenticular masses situated singly and in groups over some 750 miles of land between the 51st and 62nd degrees of latitude North. The ores contain up to 90 per cent pyrites, as well as quantities of copper pyrites, zinc blende, bornite and other minerals. Copper content is under 3 per cent, but processing of the ore is made worth while by extractable quantities of zinc. Some of these ores are also reported to contain a relatively high proportion of selenium and gold, though little development has been made of these minerals. Copper deposits in the western foothills of the Urals, occurring over 625 miles have not been developed through insufficient copper content. Similar deposits in the Donetz Basin have suffered the same fate.

On the Kola Peninsula and in the neighbouring districts of Northern Karelia, copper-nickel ore occurring with cobalt and metals of the platinum family are said to be regarded as of economic importance, their valuable subsidiary minerals also being capable of extraction.

Copper deposits in the Caucasus, although copper content is low (a total of 600,000 to 1,200,000 tonnes of metal), have reserves that are extensive. The Shalmug mine, which was exploited before 1917 by the Siemens group of Germany and contains lenticulates of up to 20,000 sq. m., is believed still to be very important.

Important reserves are also found in central Asian Russia. The biggest of these is at Almalyk, some 56 miles south-west of Tashkent, and is similar to the above-mentioned Kounrad deposits. Copper content is set at some 3,000,000 tonnes. It is reported that several new copper ore deposits have been discovered in East Kazakhstan and that copper ouput in this area will double by 1965.

Developments with Settlers

By C. C. Downie

THE use of the settler in different smelting undertakings has enjoyed only fluctuating popularity in some quarters in view of the present-day desire to speed-up all processing generally.

For example, where a regular run of nickel ore of more or less the same composition can be depended upon, the matte may be directly tapped into converters from either the blast furnace or the large oil-fired reverberatory hearth, according to a fixed pre-arranged schedule.

Garnierites of 8 per cent nickel smelted in a blast furnace of 200 tons capacity may produce some 50 tons of 30 per cent matte in the 24 hour day, and where conditions are fully stabilized, may be worked off in the converter, in 4-ton lots every 2 hours. This is done without the need of a settler, but entirely depends on precise fluxing and control of the conditions, so that the three converters will be enabled to deal adequately with the blast matte each time it is tapped.

While the " blow " takes place in one converter, another is cooling down, while the third unit is being patched or receiving any maintenance attention. Such procedure says all the more for the accuracy of briquetting, fuel selection, and other practical items.

Should, however, any defect arise, the corrosive matte would tend to accumulate unduly within the hearth, and other works not so favourably placed in the matter of consistent runs of ore, have sometimes no option but to resort to use of the settler. The blast matte here exerts unduly corrosive action alike on settler breasts, linings, and particularly spouts, and while chrome refractories were claimed to give better protection for these parts of the settler, they were only partly persevered with. Most nickel settlers appear to favour magnesite linings, which are arranged to prevent radiation of too much heat. Except under the furnace spout and slag discharge, a 4½ in. lining of the kind was claimed to last one year. With the blast furnace and converter smelting of nickel-cobalt ores and residues, a settler in some quarters is regarded as a prerequisite, largely because of the promiscuous nature of the material, since it is possible for each of the constituents to vary quite markedly. This relates alike to nickel, cobalt, iron, copper, sulphur and arsenic, and also to the variable small amounts of manganese and even chromium.

Although little has appeared in metallurgical literature generally on the difficulties which sometimes beset the cobalt smelter, one of the greatest bugbears is where unduly high proportions of chromium appear. This not only produces a virtually " infusible " slag, but a pasty one through which trickles what matte is formed.

By being produced in this promiscuous manner, the ratios of one metal to another get the opportunity to change; the relative affinities likewise vary, more oxidation attacking one metal than another, with the ultimate result that an almost unpredictable form of matte may be produced. To run such material directly into the converter could result in cobalt oxidizing before nickel, which is the reverse of what is wanted. On the other hand, when equipped with the settler, provision is made for this variable matte to collect for some time, offering the opportunity for thorough mixing, and for any necessary additions to be made to rectify discrepancies. Should the incoming matte from the blast furnace be held up for any reason, the converter has simply to await its maturing, instead of the material being delivered as a haphazard composition, which, without the settler, might give endless trouble. The settler here is usually a single oil-fired unit, and in some cases, a waste-heat boiler to supply hot water is located in the adjoining flue to ensure greater utilization of the fuel. Incidentally, in place of the earlier style of keeping the unused converter warm by hot cinders, which are tilted out prior to the " blow ", an improved type of oil burner now does this much more efficiently.

Some Constructional Features

Descriptions of settler constructions have appeared elsewhere and need not be dealt with in detail since there has not been much variation with the passage of years, except that oil-firing is almost exclusively utilized. Settlers are mostly represented by oval designed hearths, made much in the manner of an ordinary reverberatory with the oil burner at one end, but sometimes of bowl-shape with greatest depths of 5 ft., and around 20 ft. in length.

This matter of greatest depth to some extent is influenced by the regularity with which withdrawals are made, while the lining material depends not only upon the matte, whether nickel, copper-nickel, cobalt-nickel, or copper, but upon its grade, besides the character of the slag. A poor grade matte of any of these is correspondingly rich in iron, which upon lying for any appreciable length of time gets better opportunity to oxidize, despite the light slag lining. On occasion this has been known to develop a fiery disposition, become very corrosive, and result in unduly premature wear of the lining. The tap holes, located near to the bottom through which the matte is withdrawn, are closed by the same automatic stopping device as is used for blast furnaces, while tapping is done with a steel tapping bar with wedges, all of which methods follow existing practice. Settlers mounted on wheels are understood to facilitate separation of slag and matte better than overflow pots, particularly where large tonnages are handled, but this only relates to really large outfits such as the American Smelting and Refining Co.

The use of cooling coils through which water is circulated (and which have been the subject of a number of patents) for reducing the corrosion of the tapping spouts, is viewed with concern by some nickel undertakings, and they are not altogether popular. It is assumed that because the water flow is below the level of the matte, no danger would accrue in the event of a spillage, but nickel matte in making contact when molten with water can result in violent explosions, and this system is considered too risky. Although it is known that nickel matte is much more corrosive than copper matte, the tap spouts remain simply lined with magnesite, and in some cases use is made of a shaped block of magnesite, fitted into the spout. Firebrick or highly aluminous brick is used for the outer lining, and

sections not in contact with the molten material, since if the whole lining is made such a good conductor of heat as magnesite, so much is radiated that the men are incapable of withstanding it. Conditions are best suited where the converters can be run directly under this tapping spout An exception to this class of working, already mentioned, is that with consistent runs of cobalt-nickel mattes, efforts were made to entirely eliminate the use of the settler, and instead run the matte directly from the blast furnace to converter through the agency of a 60 ft. chute.

This exposure to oxidation was supposed to condition it better for blowing in the converter and was persevered with for many years, this being at the time before arsenic was systematically removed, but it sufficed to produce a partially refined cobalt-nickel matte.

Regarding other constructional features, the earlier use of water jackets for settlers, dimensions of which have been quoted in elaborate detail, does not appear to survive to any appreciable extent, partly because of unduly cooling the matte as a result of directly absorbing heat, and secondly, because of the cracking of the jackets.

Settlers for Complex Copper-Lead Mattes

The settler in copper smelting, not only affords the opportunity of manipulating the composition before entry to the converter, but also in special cases, for conditioning it prior to grinding and roasting, as is done with some silver-bearing materials. Accumulations of copper-lead mattes can result in some of the lead separating out, which does not always suit the subsequent process. On the other hand, with mattes containing upwards of 20 per cent lead, and where it is desired to get rid of most of this, the addition of metallic copper besides enriching the material, throws out surplus lead. Prior to the introduction of the heated converter, which is not limited in the matter of copper - lead ratios, this proved a double boon, as the virtually lead-free matte, enriched by poor-grade and even irony copper, could be easily blown in the ordinary converter, but this system would not have been possible without the agency of the settler. (The formula $2\,Cu + Pbs = Cu_2S + Pb$. can only be carried to completion in the closed electric hearth.) Copper can likewise expel what little antimony may be present in matte in the settler, but more care has to be given to the matter of specific gravity, and antimony is not always knocked out with the same precision as is lead.

To the student, it has to be remembered that while copper has a greater affinity for antimony than that possessed by many other metals, this entirely pre-supposes no presence of sulphur, which reverses the reactions, as in some of the cyanide smelting reactions, and if the calculated addition be made, far from any combination of the two metals taking place, metallic copper will be absorbed and antimony thrown out.

The presence of antimony in small proportions in settler matte means firstly that the bottom will usually be cleaner, and secondly, greater opportunity is afforded for antimony sulphide to volatilize.

It is but rarely that tin appears in more than a few points per cent, usually due to the incorporation of secondary metals, but while lying in the settler, the effect of heat on its sulphide frequently causes it to disappear. The advantages of comparing different types of furnaces in this connection will be apparent. In some respects, the crystallizing furnace resembles the settler in reactions.

In place of various additions of matte, metal in the form of various lead, tin, antimony alloys, is given a lengthy settling, whereby separations, otherwise not possible, are made according to changes of specific gravity and fluidity, for which elaborate tables of figures are made out. With the intervention of the aluminium process for removing antimony, much of this work has fallen into abeyance, but the experienced gained was considerable. One of the unusual reactions experienced after such metals had remained molten for days, was that minute arsenic contents disappeared, and although arsenic trioxide sublimes at 218 deg. C. and the associated metals have no strong affinity for it, no entirely satisfactory explanation for this has been given.

Settlers 26 ft. in length, and 4 ft. in depth are used for lead containing matte as tapped from the blast furnace, but care has to be exercised in any cooling-down process, which although permitting formation of a stiff upper-crust to facilitate removal in place of running off, has had disastrous results. A case has been cited where the accumulation of a slag layer containing 15 per cent zinc oxide literally closed-up the tap holes.

Specialized Settler with Regenerative System

A departure from the normal form of settler is seen in the type for continuously handling foul slags, accumulated from copper refineries, besides various large brass foundries, etc., In the ordinary way, such slags are not subjected to any furnace treatment, but are crushed, ground, and passed through jigs and concentrating table to recover the metal values. At first sight this appears the most economical method, since costs are simply power, water, labour, and plant depreciation, but the time occupied may be considerable in comparison. For example, one quotation of the performance of a popular concentrating table was 5 tons per 24 hour day, consuming anything from 12 gal. of water per min. upwards, and using ¾ to 1 h.p. Much better figures are returned where the table has to treat coarse material, but this rarely satisfies where small metallic particles have to be dealt with.

Alternatively, using the improved continuous settler with oil-firing and regenerative system, a small single hearth, occupying a fraction of the floor space, can handle 10 tons per 24 hours, and continues to work virtually unattended. It has to be observed that fuel oil in some parts of the U.S. is much less costly than here, but even with the regenerative system, in practice a thermal efficiency exceeding 30 p.c. is rarely attained. Instead of smelting the slags by a normal static reverberatory furnacing process, the material together with fluxes for thinning purposes enters from a hopper, slag continuously runs out, and all metal values accumulate in the well of the hearth until a sufficiency collects to justify tapping.

This furnace, lined with firebrick, has the oil-burners and chequer-work of the regenerative system located at one end, near to which the feed enters at one side, while the tap hole is located at the far-end from the chequer-work. Normally the temperature is around 1,100 deg. C. and is then raised to 1,440 deg. C. or whatever degree is necessary to attain the desired fluidity of the mass, since the regenerative arrangement permits heating as with a steel furnace. Where, however, only some 3 per cent copper exists and the slag is very refractory, since it would not pay to add much in the way of barren fluxes, iron pyrites (arsenic-free) are added, and the crude copper matte sold off for what it will fetch. Slags from reverberatory hearths in extensive brass foundries turn out upwards of 100 tons of slag weekly containing some 5 per cent metallic constituents, and one of the efforts with the fusion process is to run the " thinned " slag into moulds to form blocks for building purposes, which by itself is expected to pay the costs of processing .

Winning Lignite in Bulgaria

A RECENT report from Bulgaria brings news of developments at Maritsa-Istok, the lignite deposit planned to produce 10,000,000 tons of lignite annually when completed (at a cost of 225,048,000 leva—£11,250,000); where the 1960 production targets were achieved quite early in November.

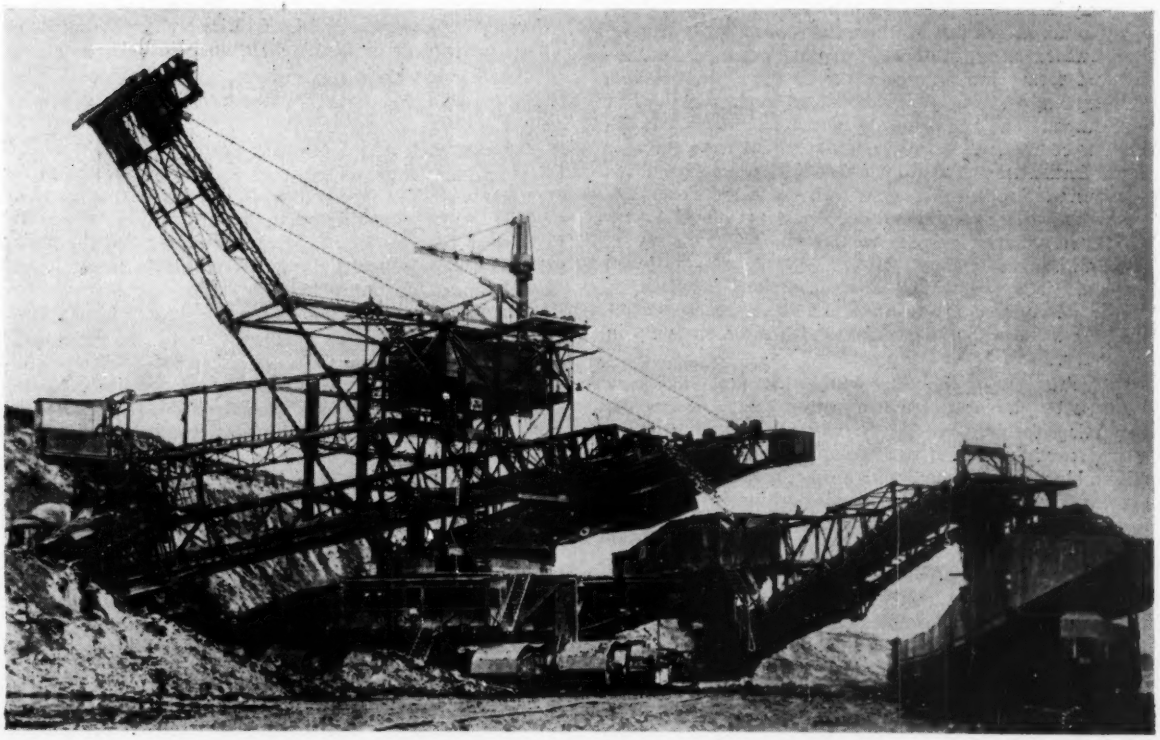
At the opencast Troyanovo-I workings, 500,000 cu. m. of overburden has been removed, representing 114.5 per cent of planned work for the year, and at time of writing it was anticipated that a further 200,000 cu. m. were likely to be removed by the end of the year. This success is ascribed largely to the introduction of six new Skoda excavators. These machines were imported from the Czechoslovak Socialist Republic earlier this year, and were brought into operation at Troyanovo-I earlier than had been expected. Each has a capacity of 3,000 - 3,500 cu. m. per day. These units are to be reinforced in the near future by a scoop-wheel excavator, Type K-800, also of Czechoslovak origin. The excavator is now undergoing trials, after 7 months' of erection. It weighs 1,300 tons. Reach achieves 72 m. (237 ft.), with rated output 30,000 cu. m. (nearly 40 cu. yds.) a day, an average railway wagon being filled each minute by jib-conveyor. Only 7 workers are required in its operation.

Further reinforcement is expected at the recently prepared Level 140, by the introduction of Type DS-1120.2 bucket excavator from the German Democratic Republic, made by VEB Schwermaschinenbau Georgij Dimitroff, Magdeburg-Buckau (formerly Maschinenfabrik Buckau).

This unit comprises a bucket chain revolving shovel with 37 buckets, mounted on rails, with a daily capacity of 40,000 cu. m. (over 52,000 cu. yds.) and a shovelling depth or working height of 20 m. (65 ft. 7 in.). Two railway lines run parallel to, and behind the machine. Feed is by jib conveyors, and power is provided by 3,000 kW. electric motors. Five operators are required.

Recently, the first use of lignite mined at Troyanovo-I was made possible by the completion of the first drying plant for the power station. The station hitherto operated on oil fuel supplied from the U.S.S.R. This plant, designed for Maritsa-Istok and manufactured in the U.S.S.R., reduces the moisture-content of the lignite from 55, to 39 per cent, thus increasing its calorific value by 40 per cent. The first drum at this drying plant is now producing fuel for the power station at a rate of 125 t.p.h., and work is in progress now on the erection of a second drum.

Scoop-wheel excavator Type K 800



Bicentenary of the Sheffield Smelting Co. Ltd.

TO mark the bicentenary of the Sheffield Smelting Co. Ltd. (1760-1960), a book entitled "Two Hundred Precious Metal Years" has been written by Ronald E. Wilson and published by Ernest Benn Ltd. Priced at 63s., this history of a prominent business engaged in the treatment of gold, silver, platinum, other precious metals and non-ferrous metals runs to 316 pages and contains a number of illustrations.

Ronald E. Wilson, the author, is a great-great-great grandson of John Read, the founder of the firm, and was born at Sheffield in 1894. Educated at Mill Hill School, he joined the company in 1913, becoming a director in 1925.

After being apprenticed to a gold refiner at Bewdley, John Read settled in Sheffield in 1760 and began to refine the scrap arising from the manufacture of Old Sheffield Plate. He quickly prospered and extended his activities to London and Birmingham. He was the first English smelter to import gold- and silver-bearing wastes from the Continent of Europe and this he did before the French Revolution.

Since its inception, the business has remained a family one and still largely belongs to John Read's descendants, though they no longer direct its operations. For 130 years it was conducted by one or more partners and, from 1890, when the partnership was converted into a private limited company, the principals have been, with few exceptions, working directors. In 1846, when William Wilson, whose wife was a grand-daughter of the founder, purchased the business, he changed its name to the Sheffield Smelting Co. and his sons developed it into the leading precious metal smelting works in the country.

Although in the difficult early 20th century period, the company had set its policy against expansion, this did not apply to the silver trade in which there was a great demand for standard silver in sheet, wire and other semi-manufactured forms and for fine silver anodes. Sheet-rolling, wire-drawing and stamping were added to the functions of the company and the company placed in use what is believed to be the first electrolytic silver refinery to be operated in the British Isles. Toward the end of this pre-1914-1918-war period South American silver, recovered from sulphides and other mining products was providing a very substantial amount toward meeting the big demands by silversmiths and platers. Early in 1914, an improved standard silver, containing some cadmium in place of copper was offered to the trade and found ready acceptance for its superior hard finish and greater economy in manufacture.

Difficulties during the years of the first world war were followed by the post-war boom and recession and the fluctuating fortunes of the 1930-39 period. During the early part of this period two executive directors not of the Wilson blood were created with power to operate the company and to cope with the difficult position in which the company then found itself, but which was relieved by the abandonment of the gold standard in 1931.

The second world war brought its difficulties, including air raid damage, but methods were devised to treating hitherto unknown and complex combinations of metals in the smelting and refining departments in order to free the individual metals and convert them to a high degree of purity for further use. New alloys quite outside previous experience were produced and fabricated. Outputs were greater in weight and quantity than the company had ever before handled and these went to help various branches of the war effort, especially the aircraft and engineering industries.

The greatest period of growth and expansion has, however, been during the past 15 post-war years. This applies both to the refining facilities and to the mechanical means of producing basic products for the manufacturing gold and silversmiths and for the engineering, aircraft, automobile and many other industries.

In 1948, Lee and Sanders Ltd., a friendly competitor, became the property of the S.S. Co. and the two companies consolidated and integrated their activities. In that year, too, the company disposed of its remaining shareholding in its Egyptian associate company, the name of which was altered to the Smelting Company (Egypt) S.A.

Owing to the substitution in 1946 of cupro-nickel for the silver alloy coinage hitherto in circulation in Britain, the company designed an entirely new refining process to deal with the quaternary alloy, but, because of building licence difficulties, this was not installed until 1949 and make-shift arrangements for the temporary operation of the process had to be made meantime. Replacement of the coinage, for various reasons, was sporadic and, later, an even more economical refining method, part chemical, part electrolytic, was evolved leading to the handling of old coins to the value of over £5,000,000 in the peak year 1955/56. This did much to enable the British Government to repay silver received as Lease-Lend loan from the U.S. during the war.

Outstanding among the company's post-war achievements has been the growth of the variety of items mechanically produced and the establishment of a precision light engineering division in Birmingham and machine tool departments in Birmingham and Sheffield.

Another branch of the business, where development has been outstanding, has been the production and sale of silver solders.

Though each of the post-war years has brought its difficulties, the tempo of business and the opportunities for trading were far in advance of anything experienced in earlier years, notwithstanding the drag of governmental controls. Year by year progress was made and the policy of devoting a substantial part of profits to research and development has borne fruit.

All the divisions of the company's activity have contributed to this progress, whether it be by the refining of silver coinage or gold from the mines of Southern Rhodesia, whether from the production of chemical preparations for electronic requirements, or whether from the sale of multitudes of wrought or sintered items, sold under the trade names of Thessco or Thessconite, or of Royd brand non-ferrous ingots. Sales of gold to jewellery manufacturers have substantially increased since more of this metal has become available. There is also a greater demand for the wares of the ancient craft of the silversmith and an upward trend in the quantity of silver hallmarked.

With the dawn of the third century of its existence, the S.S. Co. is planning the rebuilding and modernization of many of its premises. As Mr. Ronald E. Wilson states at the conclusion to his book, there will soon be nothing left of the buildings erected by John Read, but his spirit of enterprise marches on.

MINING MISCELLANY

The shaft sinking world record achieved at the No. 4 shaft, Hartebeestfontein G.M., in the Klerksdorp district, South Africa, described in our issue of December 16, 1960, was assisted by equipment of new design supplied by the South African subsidiary company of Wickman Ltd., the Coventry-based machine tool group. It will be recalled that in order that the number of shot holes drilled be reduced, 1½ in. powder is being used in the shaft, which requires 1⅛ in. drill steels instead of the traditional 1 in. The holes are drilled with 3¾ in. drifters with steels made up by Wickman S.A. (Pty.). Because of greater inherent reliability, a rubber collar is employed instead of the conventional forged steel type. The possibility of slippage has been overcome by means of a recent innovation designed to minimize fracture of the collar. The manufacturers supplied different grades of tungsten carbide tips to suit the various ground conditions encountered in the course of sinking and also different lengths and gauges of steel.

★

Contracts drawn up between the West German ferrous metals industry and Sweden's iron ore industry for 1961 cover the export of 6,875,000 tonnes of Swedish iron ore to the Federal German producers over the year. This total is 90,000 tonnes higher than that agreed for 1960, but ore prices are unchanged.

★

A second rotating furnace, with an annual capacity of 35,000 tonnes, is to be erected at the Vavdos magnesite mines on the Chalkidike peninsular of Greece. The mines, owned by the Swiss company Magnomin AG of Zurich, sell their total output for export.

★

A Cuban-Soviet communiqué signed in Moscow announced complete agreement on commodity exchanges in 1961, providing for a substantial increase in trade between the two countries. An agreement was also signed on technical assistance to Cuba in geological prospecting for iron ore and other minerals, and in the construction of a new iron and steel mill, thermal power stations and other projects. Cuban exports to the Soviet Union will include nickel oxide, and Cuba will receive Soviet oil, machinery and equipment, and other products.

★

Exports of minerals from Peru increased considerably in 1960, being 93 per cent higher in value at the end of July, 1960, than in July, 1959. Chief increases have taken place in copper exports ($U.S. 29,000,000 more than in 1959), and iron ore ($U.S.10,000,000 more) as a result of the opening of the Toquepala copper mine earlier this year and increased working of the Acari iron deposits.

★

Under a long-term trade agreement signed between Poland and Yugoslavia for the period 1961-1965, Yugoslavia will supply Poland with zinc, lead, magnesium and other products and receive from Poland coke, rolled metal products and other items.

The Swedish iron and copper mining company, Riddarhytte AB have announced their intention to invest some 14,000,000 Swedish crowns on increasing production and processing. By 1963 the company will have built a new processing unit with an annual capacity of 400,000 tonnes, which will process all ores mined from the Riddarhytte workings, rendering the present processing and sinter plant at Källfalle redundant. A new 490 m. deep working is to be sunk as part of the expansion programme.

★

Turkey has asked for tenders by January 10, 1961, from any country, for "machinery and equipment for plant for the flotation of antimony ores, including grinding and screening equipment, hydraulic classifiers, piston jigs, oscillating tables, belt conveyors, bucket elevators, water and sand pumps, pipe work, electric drives and controls, with two years' supply of parts". Information is obtainable from Ozdemir Antimuan Madenleri, Ltd., Sti. Galata, Ankara Han Kat 5, Istanbul, Turkey. The tender is in the framework of a Development Loan Fund credit grant to Turkey.

★

Seams containing an estimated 2,500,000 tons of coal have been discovered at Qudtligssat, Greenland, during borings for diamonds. This deposit is said to be greater than, and of superior quality to the 1,000,000-ton deposit at present being worked. Greenland's annual output of coal is some 30,000 tons, having increased annually by up to 1,000 since 1953. An annual government grant of Kr.1,000,000 enables coal to be sold in Greenland at Kr.100 per ton compared with Kr.170 per ton for British coal.

★

The Indonesian Manganese Trading Co. are said to be planning to raise the production of manganese mines in Indonesia from between 2,000 and 2,500 tons a month to 4,000 tons a month.

★

The Hungarian industrial complex at Csepel, near Budapest, is to spend some 400,000,000 forints over a period ending 1965 on the expansion of non-ferrous metallic base materials production.

★

Post grouting work has now begun at the International Salt Co.'s new mine in Cleveland, Ohio. Situated adjacent to Lake Erie, the mine is expected to yield 1,000,000 tons of salt annually, and will come into operation early in 1961. Cementation Co. (Canada) have carried out the grouting and post grouting operations.

★

Sir John Cass College, among its 1961 course of lectures, has arranged a series on Liquid Fuels, by its Department of Metallurgy, in preparation for the Advanced examinations in Fuel Technology arranged by the City and Guilds of London Institute and the Institute of Fuel. Fee for the course is £2—and application should be made, prior to January 16, to the Secretary, Sir John Cass College, Jewry Street, London, E.C.3.

The Venezuelan Ministry of Mines stated recently that the government would not authorize mining concessions in respect of bauxite, iron, manganese and nickel ores, and would maintain a strict watch over all present concessions still in force.

★

Work on the Greek hydroelectric project over the Acheloos River in western Greece has begun. The cost of this stage of the project is estimated at $82,000,000, of which $31,000,000 will be contributed by the U.S. Development Loan Fund. The construction of two other dams and the relevant power stations of an installed power of 75,000 kW. each, will follow at a cost of $43,000,000 the total installed capacity being 400,000 kW. Materialization of this project will open the way for a number of industries, including an aluminium industry using Greece's deposits of bauxite. Agreement for this industry has already been signed with the Greek shipping magnate, Mr. Stavros Niarchos and the U.S. Reynolds company.

★

A Travelling Bursary for a study tour of Swedish mines, established by the Atlas Copco Organization in collaboration with the Swedish Mining Association, will again be awarded in 1961. The Bursary is open to a mining graduate with at least three years' experience and is not restricted to members of the Institution. Travel and accommodation in Sweden, and travel from Britain or any European country will be covered by the Bursary. The holder will be expected to write a paper on any aspect of mining operations seen during the visit. The tour, of six weeks' duration, will be in March-April, 1961. Details and applications are obtainable from the Secretary of the Institution, and applications must be received by February 1, 1961.

★

Domestic production of coal in Peru is almost at a standstill, owing to cheap oil prices, high internal freight costs and the poor quality of Peruvian coal. The export tax of 2 per cent has been suspended to promote more production, and various schemes are being investigated for using anthracite coal deposits in thermo-electric plants. A French expert has calculated that electricity can be produced in such plants in Peru at a cost of $U.S.120 per installed kW.

★

Fourteen representatives from various sections of the U.S. coal industry have been appointed as members of a general technical advisory committee for the Department of the Interior's Office of Coal Research. This Office was authorized by Public Law 86.599 last July.

★

The High Authority of the E.C.S.C. announced that it had been agreed that Belgian collieries shutdown programme for 1961 would cover 2,000,000 tonnes output capacity. It had also been agreed that Belgian imports of coal from Community partners would be increased next year by 3.3 per cent on the fixed volume of 3,000,000 tonnes while imports from other countries would also rise by 3.3 per cent to reach a total 600,000 tonnes.

Machinery and Equipment

Door for Mine Skips and Bunkers

At the Central Engineering Establishment of the National Coal Board a flexible seal door has been designed which overcomes the sliding friction inherent in vertical steel plated guillotine type doors used on skip containers and horizontal sliding doors fitted to bunkers. The door consists of a flexible seal held across a discharge opening by a series of support rollers mounted in a movable carriage frame which can withdraw and replace the seal.

One end of the seal is attached to the top edge of the opening and the other, after being inserted between the opening and the support rollers, is lapped around the first support roller and fixed to the movable carriage which consists of two side plates, joined by tie bolts forming spindles on which the rollers rotate, and is supported under an opening by a set of guide rollers. As the carriage is retracted the support rollers withdraw from the seal and the now loose seal is peeled away from the opening in the form of a loop, allowing the material to discharge; as it is advanced, the support rollers progressively replace the seal across the opening.

Since the action of withdrawing the support rollers is rotational and the seal peels away from the opening, friction between the door and the material stored is eliminated.

The door is easily operated, requiring considerably less power than a conventional sliding door and overcomes problems of jamming or freezing; it is ideal for fitting to any bunkers containing fine granular material or material of an adhesive nature.

Using a flexible seal door weighing 300 lbs. to cover a 2 ft. 6 in. wide by 4 ft. 3 in. vertical opening on a 4 ton capacity skip container standing 16 ft. 0 in. high, the force required to open the door against a full load was found to be 710 lbs. This low power has led to the development of a system for automatic opening and closing of the discharge door of a travelling skip. A small door-operating cylinder is mounted on each skip and is controlled by a panel of valves arranged to produce a suitable sequence for automatic operation.

As the moving skip approaches its discharge station, it depresses a cam-operated valve mounted on the guide tower's framework, which allows air to flow into the female half unit, suspended in slides mounted on the guide tower, just before the male half, fixed to the top of a skip, enters and makes contact. After contact is made, air passes through filter lubricator and into a a second cam-operated valve mounted on the skip, which, if the skip is in the correct discharge position, is depressed and allows the air to pass through a four-way valve into the double-acting cylinder to open the door and discharge the material.

At the same time a tee junction off the main air supply line passes air through a secondary pipeline to a restrictor valve, and then into an air accumulator which eventually puts air on one side of the spring-loaded valve. A third pipeline by-passes these units to supply air to the inlet port of valve and when sufficient air pressure is built up in the accumulator, it depresses the spring in valve and the force of air from the third pipeline pushes down the plunger inside the four-way valve to reverse the main air flow, which then passes to the other part of the door-operating cylinder and closes the door.

A flexible seal door in its open position, fitted to a 16 ton capacity bunker for storing coal slurry. A similar door has been fitted to a coal washery refuse bunker and both have worked satisfactorily since their installation

The air pressure in the cylinder prevents the door being opened again until the male-female connection is broken by the empty skip descending. This then permits the air to exhaust from the system leaving it ready for a further operation when they are reconnected. Adjusting the restrictor valve or accumulator size determines the period of time that the door is kept open and these can be fixed to suit the quantity of material being discharged.

By suspending a female half unit in slides mounted on a headframe, fixing the male half probe to the top of a skip, and the door-operating cylinder and control panel on the skip body, an automatic discharge cycle is produced simply by raising the skip sufficiently to make connection between the male and female units. A flexible seal type door can be fitted to existing skips without altering existing door-operating gear and the power required to open a loaded door reduced to only 710 lbs. This in turn will reduce either the size or number of door-operating cylinders. Alternatively, by fitting the automatic operating equipment to a skip, it eliminates the existing door-operating carriages and their supporting structure, which can be a great saving when large spans are involved or the steelwork support structure has to be mounted within concrete headframes.

NEW VIBRATING SCREEN

At Luossavaara-Kiirunavaara, Sweden, the conventional vibrating screens have been replaced by a new type, known as L screens and developed by the mine, which are simple, inexpensive and have proved efficient for dry screening moist fines for coarse ore.

The screening surface consists of parallel transverse rows of round rods inserted in holes drilled in the side plates in such a way that the rods are free to rotate when set in motion by means of a vibrator, situated at the feed end.

The screen surface is supported by rubber buffers at the feed end and suspended by adjustable rods at the discharge end. In order to reduce wear the rod holders are made of smooth hard rubber, using a synthetic rubber of the polyurethane type and although a great deal of blending was experienced with one containing more than 1.5 per cent moisture with 15 mm. screen openings when normal vibrating screens were employed no difficulty is normally found when separating −10 mm. fines with the new L screens.

FIELD KITS FOR BERYLLIUM TEST

The Northern Miner reports that two new beryllium detectors for field work have been developed by U.S. interests.

Boulder Scientific Co. has produced a new analyzer which can perform

accurate analyses in minutes, it is gathered.

Gamma rays from an Antimony 124 source at the base of the detector bombard a specimen of beryllium which ejects neutrons. The neutrons are then detected with a Boron 10 loaded, zinc sulphide scintillation phosphor. The scintillations are converted to electrical impulses which are counted by a scaler. By comparison with the count rate from a known sample, the beryllium in the unknown one can be determined.

The analyzer is accurate within 0.002 per cent by weight, it is understood; it analyzes a sample in 3-5 min.; and the radiation dose at 1 ft. is less than 5 milliroentgens per hr. Operating costs are low and the radioactive source will last about six months with the daily cost amounting to around 70 c.

Minerals Engineers of Salt Lake have brought out a kit based on an 8-step chemical ultra-violet light procedure developed by the U.S. Bureau of Mines in identifying and rough assaying beryllium ores.

Promoters claim the kit will enable prospectors to do field assaying and identification of beryllium ores running as low as 0.1 per cent beryllium oxide.

DIESEL ENGINE FOR MINES

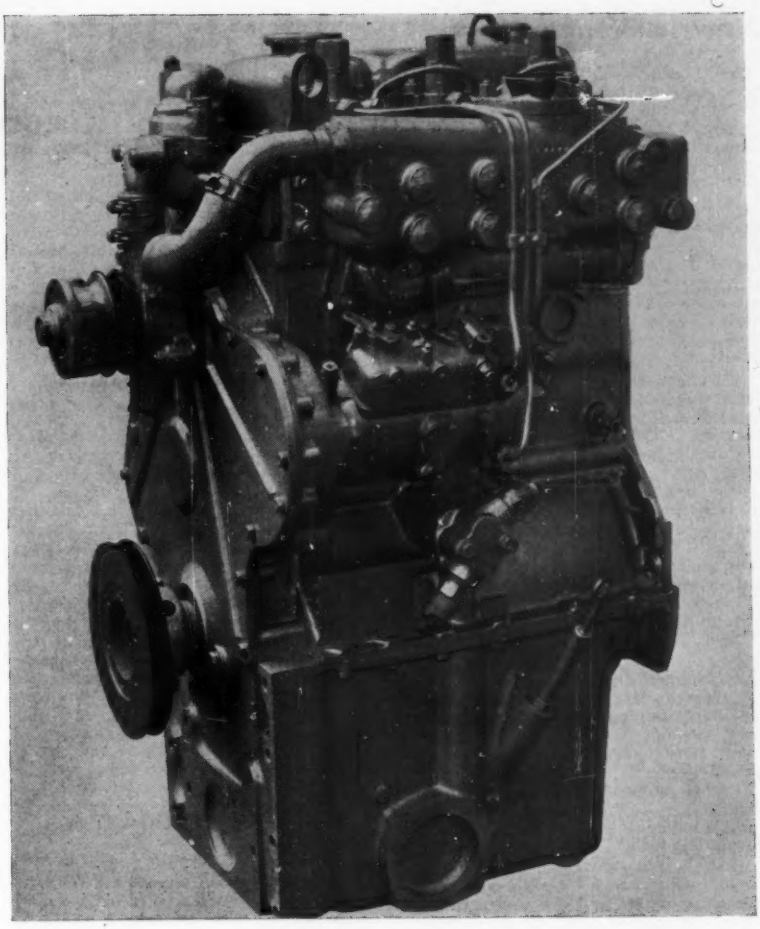
A new three cylinder diesel engine suitable for installation in flame proofed vehicles and industrial equipment is announced by Perkins Engines Ltd.

Known as the Perkins Three 152 (flame proofed), it is built to comply with the Ministry of Power's flame proofing requirements for units with engines installed. The engine has been specially produced by Perkins to meet the requirements of manufacturers of equipment for mines and other sites where flame proofing is essential to explosive dust or gases.

The new Perkins engine — first of its type to be produced by the Peterborough company — has been chosen by the Hunslet Engine Co. Ltd., of Leeds, to power their new MT 25 mines tractor. This tractor, fitted with a Three 152 (flame proofed) rated to develop 29 b.h.p. (gross) at 1,650 r.p.m., has already been awarded a Ministry "Buxton certificate", which permits its use in coal mines. The new Hunslet tractor, requiring neither rails nor special roadway is intended to operate in areas adjacent to the face where coal dust and methane gas may be encountered, but is equally at home above or below ground.

The Three 152 (flame proofed), with a cubic capacity of 152 cu. in., has a number of special features for flame proof operation including; a water-jacketed exhaust manifold to cool exhaust gases; special cylinder head, gasket, and cylinder head fixing stud holes machined to comply with "Buxton certificate" requirements; specially wide joint facings on the cylinder head for mounting the induction flame trap; and fuel atomizer seatings arranged to conform with flame proofing regulations.

Additional equipment is provided by the customer, including exhaust gas conditioner and induction flame trap, and various forms of approved non-electric starting equpment can be fitted to suit requirements.



The three cylinder Perkins Three 152 flame proofed industrial diesel engine

Design features of the Three 152 (flame proofed) include chrome plated steel liners to ensure long bore life under the most dusty operating conditions, a rotary fuel pump with an integral mechanical governor, replaceable pre-finished main crankshaft and big end bearings, and geared timing.

The engine is small enough to be installed in a machine 3 ft. wide including wheels, and 3 ft. 5 in. high. At the same time, it provides the high tractive effort required for haulage and general purposes.

HANDBOOK OF TRACTION BATTERIES

The D.P. Battery Co. Ltd., has published an attractive 32-page booklet entitled *D.P. Kathanode Traction Batteries*. Printed in purple and black, the booklet is lavishly illustrated and contains information which all intending traction battery purchasers should have at their finger-tips.

After a short introduction, which includes brief biographical notes on the formation of The D.P. Battery Co. in 1888, the booklet goes on to explain, with the aid of a diagram, the construction of a Traction Battery and gives advice on charging operation and maintenance. There are also notes on the company's sales and service organization, conditions of sale, an illustrated section on accessories and a battery record chart.

Just over a third of the booklet is devoted to cell data tables which give the complete specifications and capacities of the full range of Kathanode traction batteries.

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A new grease lubricator, the SG, by Wakefield-Dick Industrial Oils Ltd., is a positive action lubricator designed specifically for the pumping of self-levelling greases. It shows a considerable first cost saving against all-purpose grease lubricators which are necessarily more complicated in design. The new lubricator is compact but robust, has a grease capacity of 8 lb., and is fitted with up to 6 outlet connections. It can be supplied with a plain drive shaft, or the drive can be arranged through a sprocket, pulley or ratchet. Alternatively, the lubricator can be fitted with its own worm or ratchet reduction gearbox in order to take advantage of higher driving speeds.

Metals and Minerals

Nickel Consumption Reaches Record Total in 1960

Consumption of nickel by the Free World is estimated to have set up a new annual record in 1960, rising by over 15 per cent to a total exceeding 250,000 s.tons. This prediction is made by Mr. Henry S. Wingate, chairman of International Nickel, in the year-end review of the industry which has come to be traditionally associated with the company.

The main factor contributing to this record-breaking consumption was a substantial increase in the use of nickel in Europe. Differing from the pattern of past years, total consumption of nickel in the U.S. and Canada was below that of the balance of the Free World, due to large inventory liquidations by consumers of steel products in North America during the second half of the year. For 1960, the geographical distribution of the Free World's consumption of nickel is estimated as follows: Europe 43.5 per cent, U.S. 43 per cent, Canada 2.5 per cent, and others 11 per cent.

All markets for nickel advanced during the year. The use of nickel in stainless steels showed the greatest gain and now accounts for 32 per cent of the total consumption. A substantial increase was also registered for the application of nickel in electroplating, mainly as a result of the use by the automotive industry of improved techniques, permitting higher quality nickel plating.

Free World nickel producers continued to increase their production capacities in 1960 and it is estimated that before the end of 1961 the total nickel production capacity of the Free World, exclusive of Cuban sources, will approach 300,000 s.tons annually. Canada will account for more than three-quarters of the Free World's total nickel production capacity in 1961. With the Thompson project in full operation, Inco's own nickel capacity will be more than 192,500 s.tons a year. Planned annual nickel production capacity of other Canadian producers will include 32,500 s.tons or more of Falconbridge and about 12,500 s.tons of Sherritt Gordon.

The planned capacity of the French nickel company, Société Le Nickel, in New Caledonia has been estimated at about 27,500 s.tons annually. Nickel production capacity in the U.S., originating mainly from the facilities of the Hanna Mining Co. in Riddle, Oregon, remains at approximately 11,500 tons per year. The balance of the Free World's nickel production capacity consists largely of the capacity of Japanese refiners employing imported ores, which, if sufficient ore was available, could support an annual production of 17,500 s.tons of nickel.

Because of the political situation in Cuba, these figures do not include the planned capacities totalling about 50,000 s.tons of the U.S. Government's Nicaro plant, or the facilities built by Freeport Sulphur at Moa Bay.

As regards the outlook, Mr. Wingate predicts that, despite the slowness in industrial pickup in the U.S., Free World consumption of nickel will again be at a very high level in 1961. "Spurred on by intensified market and research activities, and supported by increasing supplies of the metal, industry throughout the world will be receptive to using nickel in an expanding variety of applications. The economies and technological advances which nickel can provide should result in consumption reaching new peaks in the years ahead."

ANOTHER RUSSIAN DIAMOND FIND

A survey of the U.S.S.R.'s progress and problems in the development of the Yakutian diamond fields appeared in our issue of August 26, 1960, pp. 231 and 232. The finding of yet another diamond-bearing area has been reported this month, bringing to 11 the number of major diamond deposits discovered during the past five years between the Yenissey and Lena rivers on the Central Siberian Plateau. Known by the Yakutian name of *Aihal* (glory), the new find is located in an extremely inaccessible region of the Yakurt Republic, in the valley of the River Sokhsolookh. A convoy of trucks has left Mirny, the Yakutian diamond-mining centre, with equipment for the geologists who are to explore and develop the new pipe.

THE MAGNESIUM INDUSTRY IN 1960

According to preliminary figures issued by the Bureau of Mines US. Department of the Interior, commercial production of primary magnesium in the U.S. in 1960 was 39,630 s.tons, being 28 per cent higher than the 1959 output of 31,033 tons. Producers' shipments for 1960 exceeded production by about 30 per cent. Early reports indicated consumption of primary magnesium in 1960 to have been about 44,000 tons, a gain of about 6 per cent over the previous year. New and expanded uses of the metal were reported during the year, particularly in the automotive industry. Producers' and consumers' stocks at the end of November were estimated at 75 per cent of those reported in December, 1959.

Preliminary figures indicate slight decreases from the 1959 totals in production of magnesium in some countries and increases in others. Norway's 1960 output is given as 11,000 s.tons. An expansion of facilities was completed in 1960 in the Norsk-Hydro magnesium plant which raised the annual production capacity to approximately 15,000 s.tons. In the U.K. production rose to an estimated 3,000 s.tons from 2,458 s.tons in 1959. Russia's output for the four-year period ending 1959 is indicated at 45,000 s.tons. A study of magnesium production in the U.S.S.R. is in progress, however, and in the light of new information output figures for recent years may require revision.

★

The Raufoss Arsenal works in Norway announces that it has perfected a new method for producing commercial magnesium alloys from magnesium metal. The magnesium will be supplied by Norsk Hydro of Oslo, which recently raised its annual magnesium capacity to 14,000 tonnes.

JAPAN'S FERRO-ALLOY PROSPECTS

The Japanese Trade Ministry, Japanese ferro-alloy product manufacturers, and local trade firms have jointly reviewed the Japanese ferro-alloy export target for the second half of the current financial year (October-March, 1961). Ferro-alloy exports during this period are expected to total 18,000 tonnes, or less than half the actual export shipments in the previous half-year (April-September, 1960). This would bring total exports during the whole of the financial year to 57,841 tonnes. The original export target was 89,000 tonnes.

Ferro-alloy exports, with the exceptions of low-carbon ferro-chrome and some minor items, were expected to show a sharp decline for the following reasons: A seasonal shortage of electrical power supply; actively increased growing domestic demands; the near-completion of shipments to the U.S. Commodity Credit Corporation; and the latest U.S. "save-the-dollar" policy, which might adversely affect export deals with American consumers.

The outlook for exports of ferro-alloy products in the financial year starting April 1, 1961, is described as rather pessimistic, and exports for the year are not expected to be more than 50,000-51,000 tonnes, mainly of chromium and manganese products. On the other hand, domestic demand is expected to be as brisk as during the current year, thanks to an increase in crude steel output, which is likely to total 25,000,000 tonnes.

★

There have been no developments materially to change the pattern of the chrome ore market. Business in connection with requirements for 1960 has been in progress, but the quantities involved are presumably being met without difficulty and prices are unchanged. It is hoped that, with the U.S. Presidental election over, business in that country will soon show signs of picking up. Russian ore is still being encountered, and it is believed that the U.K. is showing interest in very high grade refractory material of around 54 per cent and 3.3 to 1 ratio.

TAX BENEFIT FOR VALCO

Mr. Komla Agbeli Gbedemah, the Ghana Minister of Finance, has announced that, under an agreement signed with the Volta Aluminium Consortium, the government has agreed not to increase the company's rate of taxation for 30 years, starting on January 1, 1961. He told the National Assembly that the company, which is building an aluminium smelter in conjunction with the Volta hydroelectric project, would also benefit from a tax-free ten-year period.

COPPER · TIN · LEAD · ZINC

(From Our London Metal Exchange Correspondent)

There have been no fresh developments to disturb the general price structure of any of the metals and with the Christmas holiday intervening, market activity has been on a reduced scale during the period under review.

COPPER BACKWARDATION LITTLE CHANGED

The lower levels reached in London copper values at the time of our last report brought about some revival of buying interest, mainly in consideration of the stalemate reached in the El Teniente negotiations in Chile. In spite of further increases in U.K. warehouse stocks of altogether 1,394 tons in the last two weeks (bringing the total up to 14,094 tons), the backwardation has been maintained at about the recent rate. The Chilean negotiations have followed the usual pattern, with direct efforts to find a solution between the Braden Copper Co. and the union concerned breaking down and the workers voting overwhelmingly in favour of strike action commencing on January 3. Subsequently it was made known that the Labour Minister would intervene and union representatives announced that they were prepared to sign a new contract on similar terms to those obtained recently by the Chuquicamata workers.

In the U.S. consumer business in both the producer and custom smelter field has been quiet although dealers noted a modest increase in activity in the middle of last week following a reduction in the U.S. scrap price to 23¼ c. Consumption of copper by brass and wire mills in the U.S. in November, at 107,057 tons, showed a slight increase compared with the October figure of 105,223 tons; new business booked in November at 107,339 tons, compared with 94,118 tons in October. Fabricators' stocks declined to 446,098 tons at the end of October compared to 453,406 tons at the end of the previous month. U.K. consumption of copper in October at 62,372 tons declined from 65,748 tons in September and stocks increased to 118,033 tons against 110,300 tons.

TIN PRICES EASE

Tin prices, both in London and Singapore, have been inclined easier, but whether this setback will prove to be anything more than pre-holiday absence of consumer interest remains to be seen. U.K. official warehouse stocks have increased by 231 tons during the past two weeks to 9,407 tons. Tin shipments from Penang during the first half of December amounted to 4,263 tons, whilst in the same period those from Singapore totalled 1½ tons.

U.K. statistics show that tin consumption in October decreased slightly from 1,983 tons in September to 1,951 tons and stocks were also lower at 11,248 tons against 11,550 tons a month earlier.

On Thursday the Eastern price was equivalent to £789⅛ per ton c.i.f. Europe.

LEAD-ZINC PRICES STILL DEPRESSED

The lead and zinc markets have shown some improvement from the low points reached in the middle of the month, but in neither case is outside interest at a sufficiently satisfactory level to absorb any additional selling pressure. Whilst lead prices have tended to show a little more resistance, nearby zinc values, after a further reduction of ½ c. to 12 c. in the U.S. price, have again come under pressure. This may be read in conjunction with the settlement of the seven-month old strike at certain properties of the American Smelting and Refining Co.

Figures issued last week covering the period October 1 to December 19, showed that in the case of lead the quota figure for Canada, Yugoslavia and "other countries" has been filled, whilst for Australia, Mexico and Peru the figure is below the permitted level. In the case of zinc, imports generally are well below the quota figure and only in the case of "other countries" has it been filled.

U.K. statistics for lead show that during October the offtake amounted to 32,680 tons compared with 34,274 tons in September and stocks increased slightly to 60,218 tons against 58,157 tons a month earlier. Zinc consumption also declined at 30,598 tons compared with 33,284 tons in September but stocks decreased to 49,871 tons compared with 52,717 tons.

Closing prices are as follows:

	December 15 *Buyers*	*Sellers*	December 29 *Buyers*	*Sellers*
COPPER				
Cash	£229½	£229¾	£227¼	£227½
Three months	£226¼	£226½	£225¼	£225¾
Settlement	£229½		£227½	
Week's turnover	8,075 tons		16,475 tons*	
LEAD				
Current ½ month	£64⅞	£65	£61½	£62
Three months	£66¼	£66⅜	£63¼	£63½
Week's turnover	8,850 tons		18,675 tons*	
TIN				
Cash	£798½	£799	£786½	£787
Three months	£796	£796½	£785½	£786
Settlement	£799		£787	
Week's turnover	745 tons		1,090 tons*	
ZINC				
Current ½ month	£81¼	£82	£75½	£76¼
Three months	£82	£82½	£77	£77½
Week's turnover	8,525 tons		13,250 tons*	

* (8 days)

LONDON METAL AND ORE PRICES, DEC. 29, 1960

METAL PRICES

Aluminium, 99.5%, £186 per ton
Antimony—
English (99%) delivered, 10 cwt. and over £200 per ton
Arsenic, £400 per ton
Bismuth (min. 1 ton lots) 16s. lb. nom.
Cadmium 11s. 0d. lb.
Cerium (99%) net, £15 0s. lb. delivered U.K.
Chromium, Cr. 99% 6s. 11d./7s. 4d. lb.
Cobalt, 12s. lb.
Germanium, 99.99%, Ge. kilo lots 2s. 5d. per gram
Gold, 254s. 1d.
Iridium, £20/£23 oz. nom.
Lanthanum (98%/99%) 15s. per gram.
Magnesium, 2s. 2½d./2s. 3d. lb.
Manganese Metal (96%/98%) £275/£285
Nickel, 99.5% (home trade) £600 per ton
Osmium, £18/£22 oz. nom.
Osmiridium, nom.
Palladium, Imported, £8 12s. 6d.
Platinum U.K. and Empire Refined £30 5s.
Imported £28½/£28⅝
Quicksilver, £69½ ex-warehouse
Rhodium, £43/£45 oz.
Ruthenium, £14/£16 oz. nom.
Selenium, 46s. 6d. per lb.
Silver, 79⅛d. f. oz. spot and 79½d. f'd.
Tellurium, 28s. 6d. lb.

ORES AND OXIDES

Antimony Ore (60%) basis		21s. 6d./22s. 0d per unit c.i.f.
Beryl (min. 10 per cent BeO)		240s./245s. per l. ton unit BeO
Bismuth		65% 8s. 6d. lb. c.i.f.
		18/20% 1s. 3d. lb. c.i.f.
Chrome Ore—		
Rhodesian Metallurgical (semifriable 48%)	(Ratio 3 : 1)	£15 5s. 0d. per ton c.i.f.
" Hard Lumpy 45%	(Ratio 3 : 1)	£15 10s. 0d. per ton c.i.f.
" Refractory 40%		£11 0s. 0d. per ton c.i.f.
" Smalls 44%	(Ratio 3 : 1)	£13 5s. 0d. per ton c.i.f.
Baluchistan 48%	(Ratio : 3 : 1)	£11 15s. 0d. per ton f.o.b.
Columbite, Nigerian quality, basis 70% combined pentoxides (Ratio 10 : 1) Nb_2O_5 : Ta_2O_5		170s./172s. 6d. per l. ton unit c.i.f.
Fluorspar—		
Acid Grade, Flotated Material		£22 13s. 3d. per ton ex. works
Metallurgical (75/80% CaF_2)		156s. 0d. ex. works
Lithium Ore—		
Petalite min. 3½% Li_2O		50s. 0d./55s. 0d. per unit f.o.b. Beira
Lepidolite min. 3½% Li_2O		50s. 0d./55s. 0d. per unit f.o.b. Beira
Amblygonite basis 7% Li_2O		75s./85s. per ton f.o.b. Beira
Magnesite, ground calcined		£28 0s./£30 0s. d/d
Magnesite Raw (ground)		£21 0s./£23 0s. d/d
Manganese Ore Indian—		
Europe (46%-48%) basis 60s. 0d. freight		73d./75d. c.i.f. nom.
Manganese Ore (43%-45%)		69d./71d. c.i.f. nom.
Manganese Ore (38%-40%)		nom.
Molybdenite (85%) basis		8s. 11d. per lb. f.o.b.)
Titanium Ore—		
Rutile 95/97% TiO_2 (prompt delivery)		£28 0s. 0d. per ton c.i.f. Aust'n
Ilmenite 50/52% TiO_2		£11 10s. per ton c.i.f. Malayan
Wolfram and Scheelite (65%)		148s. 0d./153s. 0d. per unit c.i.f
Vanadium—		
Fused oxide 95% V_2O_5		7s. 6d./8s. per lb. V_2O_5 c.i.f.
Zircon Sand (Australian) 65-66% ZrO_2		£16/£16 10s. ton c.i.f

Mining Finance

Platinum Share Prospects

The full reports of the South African platinum companies have now been published. The dividends, profits and the very full preliminary statement about the platinum situation were detailed here on September 30 last.

As then stated, the quantity of metal sold by Rustenburg Platinum Mines, the big South African producer, in the year to August 31 was virtually the same as that disposed of in the preceding twelve months. Actual production details are never given by the company by agreement with Johnson, Matthey and Co., who are the refiners and sellers of Rustenburg's output.

After being active during the first half of the financial year the platinum market was "relatively quiet" during the second half, it is stated. Since then there has been a seasonal improvement, "but it is as yet too early to assess the probable volume of sales for the current year. At this stage there is, however, no evidence to indicate that it will be materially different from that of the two preceding years".

If this turns out to be the case the 1960-61 outlook for the platinum companies would be quite good, because so far the metal price has been sustained at the improved level of £30 5s. an oz. reached last January, which is slightly above the average of £29 11s. 4d. received in the year to last August and well above the £24 13s. 3d. for 1958-59.

There is, of course, some feeling of caution about the price at the moment which, it is thought, might have to be lowered if the United States does not pull out of its recession. On this point the Rustenburg report has this to say: The overall demand for platinum is largely determined by the level of world industrial activity. Sales to the United States markets have been somewhat disappointing, but sales to other countries have improved. It is added that there has been no increase in the amount of platinum sold to the oil industry. It was over-estimates of the demand from this source for use in "cat-crackers" that prompted Rustenburg to greatly increase its plant capacity a year or two ago—a capacity that has never been fully used.

It is notable however, that during the past year the new reduction plant has at last been commissioned. The object of this was the pursuance of the group's present policy of building up stocks of metals to "suitable levels", in other words to levels that can meet any sudden uprush of demand without causing a runaway in the price which the Rustenburg-Johnson Matthey link-up has always tried to keep as stable as possible. It is stated that further adjustments in the scale of production will be made from time to time in the light of the estimated forward requirements for platinum and in the light of the levels of pipeline and refined stocks available from past production.

The capital of Rustenburg is held by three companies. Potgietersrust Platinums holds 43.3 per cent, Waterval (Rustenburg) Platinum Mining 39.2 per cent and Union Platinum Mining 17.5 per cent. These concerns usually pay out in full the dividend revenue that they receive from Rustenburg. At the moment the only threat to last year's good dividend rates seems to be the operating company's rising tax bill. It paid materially more in this respect in 1959-60. The reason was that the capital expenditure ranking as a set-off against tax liability was £900,000 against £1,360,000 a year previously. The allowance for this year may be only around £425,000.

But the shares show handsome yields on the 1959-60 payments even without allowing for double tax relief; over 17 per cent on Potgietersrust at 8s., more than 18 per cent on Waterval at 13s. and over 19 per cent on Union at 11s. 9d. In part, of course, these large returns reflect the present distrust of South

FEDERAL GOVERNMENT OF NIGERIA

SCIENTIFIC OFFICER (MINERAL DRESSER)

The Geological Survey Division of the Federal Ministry of Mines and Power has vacancies for Scientific Officers (Mineral Dressers) to undertake research on mineral dressing, particularly in connection with the recovery of minerals from alluvial concentrates in the Plateau tinfields.

Candidates should hold a good honours degree in Mineral Dressing or Mining Engineering, preferably with some experience in industry. Candidates should preferably not be over 35 years of age.

Contract: appointment for one tour of 15-18 months in the first instance with prospect of extension. Salary according to qualification and experience £1,434-£2,196 per annum (including inducement addition) plus gratuity of £100-£150 on satisfactory completion of service. Outfit allowance of £60 payable for salaries not exceeding £1,740. Free passages for officer and wife. Liberal home leave on full pay. Quarters and income tax at low local rates. Children's allowances while separated. Write for application forms and further particulars, stating briefly age, qualifications and experience, to the Appointments Secretary, Federal Public Service Commission, Nigeria House, 9 Northumberland Avenue, London, W.C.2, quoting J.2/5.

LONDON MARKET HIGHLIGHTS

The inevitable holiday lull descended upon mining share markets during the past week or so but as far as golds were concerned, prices held remarkably firm. Business between Johannesburg and London was additionally checked by the fact that many stocks are about to be quoted "ex-dividend", but there were still sufficient inquiries to lift Marievale, for instance, to the best price for 1960 of 29s. 9d.

Among the new mines, Free State Geduld recovered from their recently depressed price of 123s. 9d. and rose to 126s. 10½d. before easing back to 124s. 4½d. Western Holdings (152s. 6d.) were occasionally supported by both Johannesburg and London, the former centre being also interested in West Driefontein (98s. 9d.) and West Wits (71s. 3d.). A notably firm spot in an otherwise neglected Finance House group was Gold Fields, the shares climbing 3s. 1½d. in a few days to 64s. 3d.

De Beers encountered a revival of buying interest and rose from 152s. 6d. to 156s. 3d.; both Johannesburg and London were hoping that higher diamond sales figures for the last quarter of 1960 would be announced in January.

Copper share prices moved narrowly for most of the time; there were no keen buyers pending the outcome of the Central Africa talks but equally few holders wished to sell at currently depressed price levels. Bancroft hardened a few pence to 15s. 3d., but Rhokana were dull at around 44s. 6d.

Tin share prices eased in sympathy with the drifting metal price, but there was very little selling. Later, the share market staged one of its revivals and Ayer Hitam which had fallen to 20s. 6d. quickly rebounded to 21s. 3d. Despite the cautious tone of the chairman's speech, Ipoh hardened to 20s.

In a very nominal market Tongkah Harbour were marked up 3s. 7½d. to 45s. 7½d. There is no real market in the shares here, even though it is possible to deal on a nominal basis, but they have a good following in Singapore. The sudden interest in Tongkah Harbour here stemmed from the company's unusual proposal to change its domicile from Malaya to the U.K. The chairman pointed out that his company pays tax on its operations in Thailand and in addition Malayan tax is deducted from the dividends it distributes. Change of domicile to the U.K. would mean considerable tax savings because the Malayan tax would be avoided and the company would qualify for overseas trading corporation concessions.

Feature of the lead-zinc share market was the sharp recovery in prices of Consolidated Zinc and New Broken Hill that followed news of the latest smelting arrangements between the two concerns. Consolidated Zinc advanced from 61s. to 65s. and New Broken Hill rose 2s. 6d. to 41s. Elsewhere, the Ghana gold producer, Ashanti, recovered further to 14s. on the view that the recent fall in the shares had been overdone.

African shares generally owing to the political risks involved. But they certainly seem to make platinums look too low rather than too high. The shares could, in fact, be responsive to any turn for the better in the U.S. economy next year under the new Administration there. The 1960-61 interims are due to be declared in March.

TREPCA HOLDERS STILL HOPING

Stockholders in Trepca Mines are after all to enter the New Year still doing no more than hoping that their 6s. 4d. in cash per 5s. unit will at long last come within their grasp. The latest news of this marathon legal affair, which looked so near a final solution when the liquidator, Mr. Edward Bostock, was able to announce an agreement with the chief claimant Mr. Pasic in November, is that the application to proceed with the asset distribution has been stood over by the Registrar of the Companies Court until January 30.

The reason for this is that a writ has been issued against the company by Mr. Roger Teyssou. The Registrar directed that Mr. Bostock should give notice to Mr. Teyssou and certain other of Mr. Pasic's creditors that unless they attend the adjourned hearing to oppose the application, or prior thereto obtain an injunction against Mr. Bostock, the Registrar will then authorize the distribution to stockholders "upon the footing that the company's liability to Mr. Pasic has been validly compromised at £70,000 and that the claims that have come to my notice are against Mr. Pasic and not the company".

As a result of this further development Trepca has re-opened its share registers and dealings in the units have been resumed on the London Stock Exchange. The present price is 5s. 9d. Most stockholders, having been patient so long, will no doubt elect to wait a little longer. The recently formed shareholders' committee have, incidentally, approved Mr. Bostock's settlement with Mr. Pasic and also the proposed liquidator's fee of 10,000 guineas.

IPOH'S TEMPORARY DIFFICULTIES

In his annual statement to shareholders in Ipoh Tin Dredging the chairman, Mr. R. Ellerton Binns, was unfortunately unable to be joyful about the company's near-term prospects now that output restriction has been removed under the International Tin Agreement. Since the close of the last financial year on March 31 there have been two enforced shut-downs of the dredge. It is now working satisfactorily, but is in low-grade patchy ground through which it must dig its way in order to reach normal payable ground. So, Mr. Binns says, "in the shadow of these adverse circumstances it would clearly be unwise to expect much more than a small profit at best from the current year's working". For 1959-60 Ipoh made a net profit of £28,607 and paid 3s. per 8s. share which absorbed £18,375.

The property's life is limited so it is important that fresh ground should be obtained. The company, Mr. Binns says, is actively engaged in a search for new areas, but so far with no success beyond the acquisition of a small one adjacent to the present property. Another "fairly substantial area" is being considered which will be examined and tested if satisfactory arrangements can be concluded.

Ipoh stand at 20s. They have one very strong factor backing them at this price despite the discouraging near-term outlook. The balance sheet at March 31 last showed net liquid assets equal to 20s. a share on the modest £80,000 capital.

RAMBUTAN ALSO IN TROUBLE

Rambutan, the Malayan tin producer in the Cornish-Malayan group, is taking advantage of de-restricted sales of ore despite technical troubles caused by exceptionally large quantities of stone which are hindering the operations of this hydraulicing concern. In the year to June 30 output was 154.11 tons of tin ore and permitted sales were 170.76 tons, the balance of these sales being

(Continued overleaf)

WITBANK COLLIERY, LIMITED

(Incorporated in the Union of South Africa)

Extracted from the ANNUAL REPORT for the year ended 31st August, 1960

AUTHORIZED AND ISSUED CAPITAL
£1,540,000 in Shares of £1 each, fully paid

Working Profit	£411,420	
Add Sundry Revenue *less* Expenses	2,486	
	413,906	
Taxation	110,668	
Profit after Taxation	303,238	
Balance of Income and Expenditure Account at 31st August, 1959	313,457	
		£616,695
Dividends declared :—Nos. 107 of 1s. 2d. and 108 of 1s. 4d. per share	192,500	
Transfer to Capital Reserve—net expenditure on mining assets and trade investments	46,482	
		238,982
Balance of Income and Expenditure Account at 31st August, 1960		£377,713

The coal despatched from the mine amounted to **1,801,198** tons being an increase of 90,465 tons compared with the total for the previous year. Of this increase, **65,785** tons were produced from Wolvekrans Section.

The working profit improved by **£7,741** to **£411,420.**

It is estimated that capital expenditure during the twelve months ending 31st August, 1961 will amount to approximately **£52,000** of which **£35,000** will be spent on the modernization of the underground electrical switchgear in accordance with the recent requirements of the Mines Department.

The full Report and Accounts may be obtained from the London Secretaries, A. MOIR & CO. LIMITED, 4, London Wall Buildings, London, E.C.2.

FEDERAL GOVERNMENT OF NIGERIA

SCIENTIFIC OFFICER (GEOPHYSICIST)

The Geological Survey Division of the Federal Ministry of Mines and Power has vacancies for Scientific Officers (Geophysicist) to conduct geophysical surveys using a.c. and d.c. resistivity apparatus, d.c. potential equipment, vertical forces magnetic variometer, shallow seismic gear, and equipment for logging resistivities and temperature gradients in boreholes.

Candidates must hold a good honours degree in Geophysics, Physics, or Engineering. Alternatively a good honours degree in Geology, with Physics or applied Mathematics as subsidiary subjects. Experience in applied Geophysics, and some knowledge of Electrical Circuitry and an ability to maintain apparatus will be added advantages. Candidates should preferably not be over 35 years of age.

Contract: appointment for one tour of 15-18 months in the first instance with prospect of extension. Salary according to qualifications and experience £1,434-£2,196 per annum (including inducement addition) plus gratuity of £100-£150 on satisfactory completion of service. Outfit allowance of £60 payable for salaries not exceeding £1,740. Free passages for officer and wife. Liberal home leave on full pay. Quarters and income tax at low local rates. Children's allowances while separated. Write for application forms and further particulars, stating briefly age, qualifications and experience, to the Appointments Secretary, Federal Public Service Commission, Nigeria House, 9 Northumberland Avenue, London, W.C.2, quoting J.3/5.

MINING FINANCE—*Continued*

provided from stocks. In the current financial year the chairman, Mr. W. E. Hosking, says that sales have so far totalled 101 tons of which 57½ tons were sold in October and November following the suspension of restriction.

At the same time steps are being taken to overcome the current abnormal mining conditions. If successful they should result in more favourable returns. Work is in hand to increase the scope of mining operations in sections of the property other than paddock "Z" where the chief trouble lies. A more comprehensive scheme of work to enable the exploitation of the enrichments in this paddock, both laterally and in depth, is stated to be also under active investigation.

Rambutan 5s. shares are quoted at 14s. 6d. The yield is infinitesimal on the 3d. that was paid for 1959-60 despite a loss having been made for that period. There should be a larger distribution for the current year despite the company's present difficulties.

BROKEN HILL IN WESTERN AUSTRALIA

The increasing demand for steel in Australia is being met by further expansion by the Broken Hill Proprietary Co. Ltd. An agreement has been made between that company and the Western Australian Government for the construction of an integrated iron and steel industry at Kwinana, 20 miles from Perth. The cost of the project when completed will be £A.80,000,000, to be spent over a period of 18 years. A condition bearing upon the new enterprise is the construction by the Western Australian and Commonwealth Governments of a standard gauge railway between Kalgoorlie and Kwinana, at an estimated cost of £A.35,000,000.

The company will be granted leases over the iron ore deposits at Koolyanobbing, Dowd's and Bungalbin. These deposits are north-east of Southern Cross, and 235 miles from Perth, and are estimated to contain 100,000,000 tons of high grade ore.

The blast furnace planned will have a capacity of 450,000 tons of basic iron per year and call for the supply of 800,000 tons of iron ore per year. Capacity of the steel making plant and rolling mills will approximate 330,000 tons a year.

It is not unlikely that this project will cause the abandonment of the proposals for export of iron ore overseas from Western Australia. It will also stimulate the systematic examination of the lesser iron ore deposits in the State, which aggregate a substantial tonnage of potential, and as yet, unproved ore.

Malaysiam Tin.—At an extraordinary meeting of Malaysiam Tin last week resolutions were passed to reduce the capital and repay 6d. per 2s. share and to effect certain alterations to the articles of association.

President Brand deflections.—Following the poor results obtained by President Brand from Borehole SP7 (*M.J.*, December 9), two further deflections have also produced poor values. No further deflections are to be made. The borehole is situated 6,900 ft. due south of the No. 2 sub-vertical shaft.

BRITISH OVERSEAS MINING ASSOCIATION

DEVELOPMENT FRUSTRATED BY TAXATION

The fifteenth annual general meeting of British Overseas Mining Association was held on December 21, at Barrington House, 59 Gresham Street, London, E.C.

Mr. Val Duncan, O.B.E., President, said: Last year when my predecessor, the late Mr. A. V. Conrad, addressed you he expressed the hope that Her Majesty's Government would introduce measures in the Budget for 1960 that would remedy the short-comings of the legislation relating to Overseas Trade Corporations. He outlined the amendments to which our Association attaches the greatest urgency and in regard to which it has made very full representations to successive Chancellors of the Exchequer.

Since then, the 1960 Budget has been introduced and its provisions passed into law, but unfortunately it did not meet any of the submissions which were made on behalf of the British Overseas Mining Association. Another year has passed, another Chancellor has laid down his office and we are no further forward.

Last year there was a strong case to support our proposals but this year I believe that it is even stronger. In recent months events in many parts of the world—notably throughout Africa and in Cuba—have underlined the risks that are inherent in the business of overseas mining, where sequestration may mean the complete loss of a company's assets. This has all happened at a time when governments and international bodies are urging the importance of developing the under-developed territories and urging private enterprise to play its part.

Mining Industry's Special Position

As our tax laws stand at present, a British mining group, with subsidiaries resident outside the United Kingdom, cannot apply its profits from these overseas subsidiaries to the best economic advantage. Furthermore, any tax concessions which may be granted abroad to induce mining companies to take the risks inherent in the development and exploitation of mineral deposits overseas are not recognized by the United Kingdom government.

I do not propose here to go in detail into the proposals which we have submitted to the Government on your behalf and which we propose to submit again. Suffice it here to assure you that the Council of the Association and its Officers attach the very greatest importance to this matter, and that they will go on doing everything they can to bring home to the Government the need for recognizing the special position of the British overseas mining industry.

Mining Industry's Part in Overseas Development

Our industry is justly proud of the part that it has played in developing the world's resources. Indeed, there is hardly a country the development of whose economy has not been helped in some way by the activities of the British mining industry.

To-day, the development of mineral resources holds the key to the future of many of the emergent nations. It also offers a challenge to the free world. The importance of meeting this challenge is being constantly underlined. The British overseas mining industry is, I believe, uniquely equipped to play a leading part in this great task. It has the experience necessary and highly-trained staffs backed by world-famous training institutions. It also has at its disposal the substantial financial resources without which no large scale mineral development can be contemplated to-day.

Commensurate Reward for Risks Taken

It has, however, to be remembered that the British mining industry, like its counterparts in other highly developed countries, is private enterprise employing shareholders' money. There can be no question as to the risks inherent in many of the most urgently needed developments. The leaders of this industry can only be justified in running these risks with their shareholders' money if they can see a reasonable chance of their shareholders reaping a commensurate reward. Our taxation system does not make this possible. I am not putting it too strongly when I say that, unless the taxation laws can be amended as we have proposed, it will be difficult, if not impossible, for the British overseas mining industry to go on playing its full and important part in developing the resources of the world.

This problem, the solution of which, I believe, is essential not only to our industry but also from the point of view of the country, is by far the most important one with which our Association is concerned. During the past year it has occupied a great deal of the time of the members of the Taxation committee, whose efforts have been untiring. I would like to pay a special tribute to this committee, and, in particular, to its Chairman, Mr. A. G. Davies, for the valuable work that they have done, and are doing.

I am glad to be able to report that the work of The B.O.M.A. Educational Trust is proceeding satisfactorily. At present, twenty-two students are taking courses in mining engineering at Universities and Schools of Mines in this country with the aid of B.O.M.A. scholarships. These scholarships, the present value of which is £350 per annum, are granted without any question of means test and I am confident that they will play a useful part in ensuring the continued influx of young men of good quality into the overseas mining industry.

Finally, I would like to express the Association's thanks to all members of the committees for the work they have done during the year and to our Secretary, Mr. R. A. Alldred, for the helpful and efficient way in which he has administered the affairs of the Association.

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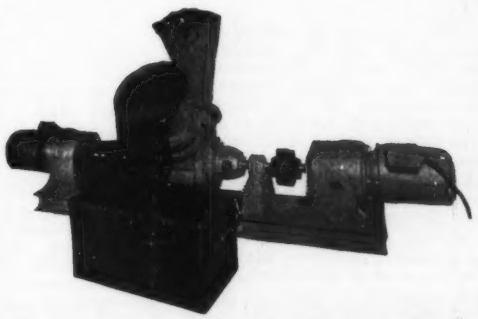

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Book Reviews

Mechanized Cutting and Loading of Coal, *by R. Shepherd, Ph.D. and A. G. Withers, Ph.D. 328 pp. with tables and illustrations. Published by Odhams Press Ltd., London at 50s.*

This is an extremely well written account of coal getting and loading equipment containing a wealth of detail regarding the construction and application of these machines. The rate of technical developments in this field has been so rapid of recent years that the need for such a textbook has been manifest. Within the eighteen chapters the essential details of most modern face machines in Europe and America are classified together with an objective account of the merits of each. Thus it is possible to readily appraise current developments, particularly in that the authors have devoted considerable attention to the practical underground application of the various machines.

An historical review of coal face cutting and loading machinery is followed by chapters dealing with the fundamentals of coal breakage and an analysis of how this is achieved with individual machine types. Ancillary equipment such as electrical apparatus is briefly, but adequately, dealt with, together with consideration of the safety and health problems arising from the introduction of large scale mechanization projects.

The final chapter is given over to a discussion of future trends and possible developments in the field of face mechanization. A very readable text allied to extremely clear diagrams and illustrations make *Mechanized Cutting and Loading of Coal* essential reading for all interested in the mining of this fuel.

Transportprobleme Geloest Vol. 6. of Die Materialfoerderung in Bergwerksbetrieben, *by Dr. -Ing K. Schucht. Published by Otto K. Krausskopf, Wiesbaden, W. Germany, price D.M. 24.50. pp. 106, 66 graphs and illustrations.*

In 1957 a survey of mining in the Ruhr indicated that the transport employed solely on carrying materials and equipment for tunnelling, digging and service accounted for an undesirably large proportion of the total amount of tonnage moved. Since the movement of anything other than coal out of the mine represents an expense of time and money, it was considered desirable in the interests of efficiency to conduct a material flow analysis.

The procedure adopted in the examination was to average results obtained in a number of different mines in order to establish a general picture. From this a rationalization of transport methods was attempted with a view to reducing transport costs. The examination was confined to existing conditions and only apparatus readily available was employed. Similar tests, previously conducted in other industries, had shown the necessity of producing a specially designed card for the tabulation and presentation of the particular quantities and results involved. The system employed enabled an immediate assessment of the conditions obtaining at the time of the investigation, and indicated where improvement might be effected.

The results quoted in this book are taken from a series of tests carried out in eight Ruhr mines in 1958. Considerable attention is given to problems of determining the most economical means of transport of given lengths of pit props, rail sections, pipes, etc. There is a discussion on various commercially available systems, based on rail, conveyor belt and suspended car. Comparisons are made of the facilities for handling given loads on the various types of wagons or trucks available in each system.

The observations deal first with the conveyance throughout the mine, above and below ground, of wood, constructional materials and amorphous "liquid" loads, such as earth, concrete and coal, and, secondly with the handling of plant at the face.

It is claimed that the recommendations suggested would enable a reduction in conveying costs of as much as one third. The validity of the results for use outside the Ruhr, however, must obviously be affected by such factors as varying geological conditions and, in the case of mines outside the Ruhr, the availability of equipment of the types specified or their near equivalents. The book is amply illustrated and contains an extensive bibliography.

Publications Received

The 47th annual issue of *Metal Statistics*, published by Metallgesellschaft Aktiengesellschaft, Frankfurt Am Main, covers the period 1950-1959. It contains a survey of the metal industry in 1959 and the first half of 1960, followed by statistical surveys of bauxite and aluminium, lead, copper, zinc, tin, cadmium, magnesium, nickel, mercury and silver. The tables cover mine, smelter and refinery production, consumption, including a detailed survey by countries, and annual price averages over periods going back in most instances as far as 1900.

*

The South African Department of Mines Geol gical Survey have published Information Pamphlet No. 6, entitled *Pegmatites: Hints to Prospectors* by B. Booysen, Inspector of Mines, which, in addition to chapters on description and exploitation of pegmatites, gives information on the various economic minerals to be found in pegmatites and notes on their tests and uses.

*

Star Aluminium Company of Wolverhampton and Bridgnorth have published an illustrated booklet entitled *The First Twenty-Five Years* which provides a record of their expansion and development since 1933, when Star foil rolling mills were set up at Wolverhampton. The company's aim is to produce the full range of best quality aluminium foils in a fully integrated plant.

*

The results of a survey carried out during 1956 and 1957 by field parties of the Bureau of Mineral Resources, Geology and Geophysics, of the Australian Department of National Development have been published under the title *The Geology of the Eastern Central Highlands of New Guinea* by N. J. McMillan and E. J. Malone. The work was the first investigation undertaken by the Bureau in a continuing programme of regional mapping of areas in Papua and New Guinea. The area was mapped on vertical aerial photographs at a scale of approximately one inch to 4,200 ft., and plotted at a scale of one inch to two miles, its main purpose being to assess the economic potential of the area, but no evidence of large scale economic mineralization was found.

The first report published by the Somaliland Protectorate Geological Survey is concerned with *The Heis-Mait-Waqderia Area*, Erigavo District, and is the product of joint field work carried out by the authors, J. E. Mason and A. J. Warden during 1955 and 1956. The aim of the work was to make a geological survey of the rocks of the Basement System and contiguous sedimentary outcrops. The Report concludes that the economic prospects of this area do not appear to be promising, as very little evidence of mineralization was seen.

*

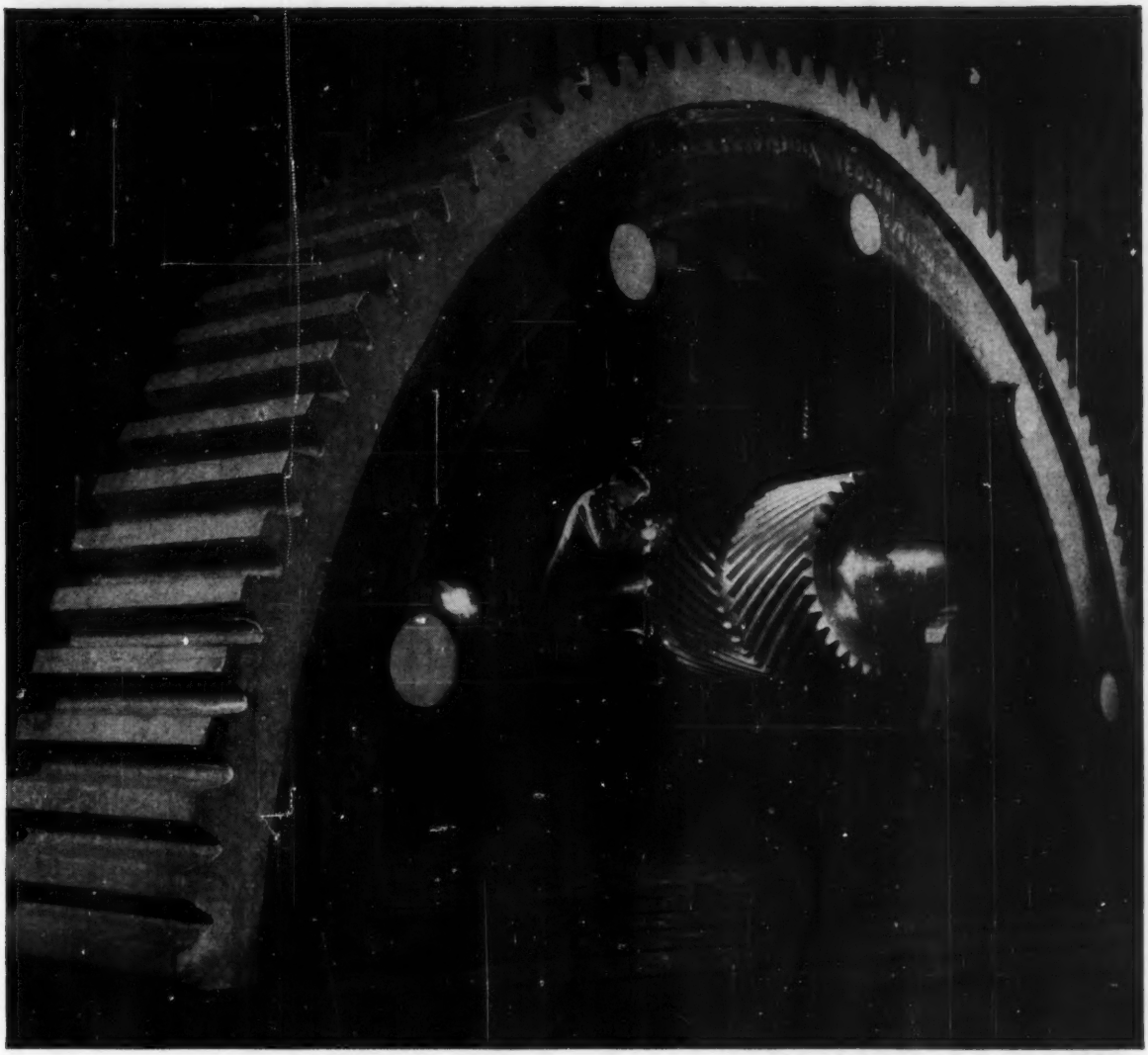
Recent titles of Bulletins of the Geological Survey of India, Series A—Economic Geology, include: No. 15, The Manganese-ore deposits of Panch Mahals and Baroda Districts, Bombay State by B. C. Roy; No. 16 High grade Limestone Deposits, Dehra Dun-Mussoorie Area, U.P., by D. R. S. Mehta, B. R. Narayana Murthy and A. S. Narasimhan; and No. 17, The Manganese-ore deposits near Joida, North Kanara District, by B. C. Roy. They are obtainable from the Manager of Publications, Civil Lines, Delhi.

*

A 42-page bulletin entitled *Historical Statistics of Minerals in the United States* has been published by Resources for the Future, Inc., 1775 Massachusetts Ave., N.W., Washington 6, D.C. The bulletin is a reprint of the Minerals Chapter of *Historical Statistics of the United States—Colonial Times to 1957*, published in 1960. The basic materials were prepared by Sam H. Schurr, director of energy and mineral studies for Resources for the Future, Inc., with the assistance of Elizabeth K. Vogely.

*

A report of the Minister of Mines of the Province of British Columbia has been published each year since 1874. The latest report, for 1959, contains introductory sections dealing with Statistics and Departmental Work, followed by sections dealing with Lode Metals; Placer; Structural Materials and Industrial Minerals; Petroleum and Natural Gas; Inspection of Lode Mines, Placer Mines and Quarries; Coal; and Inspection of Electrical Equipment and Installations.



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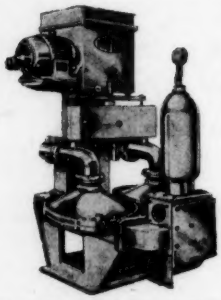

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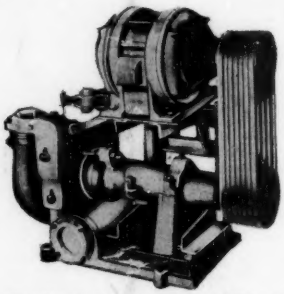

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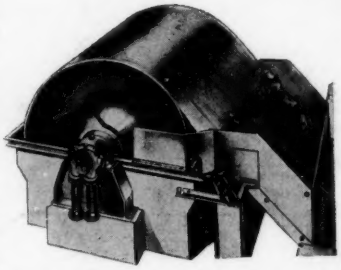

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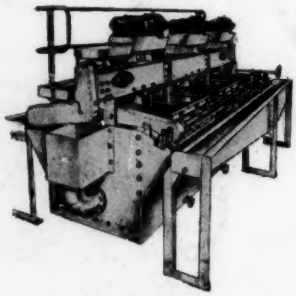

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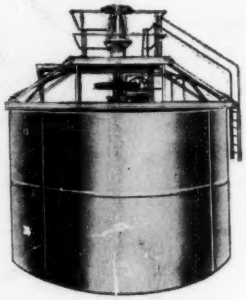

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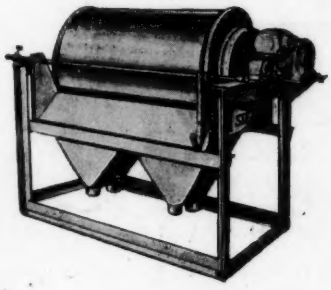

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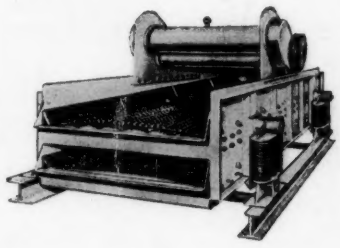

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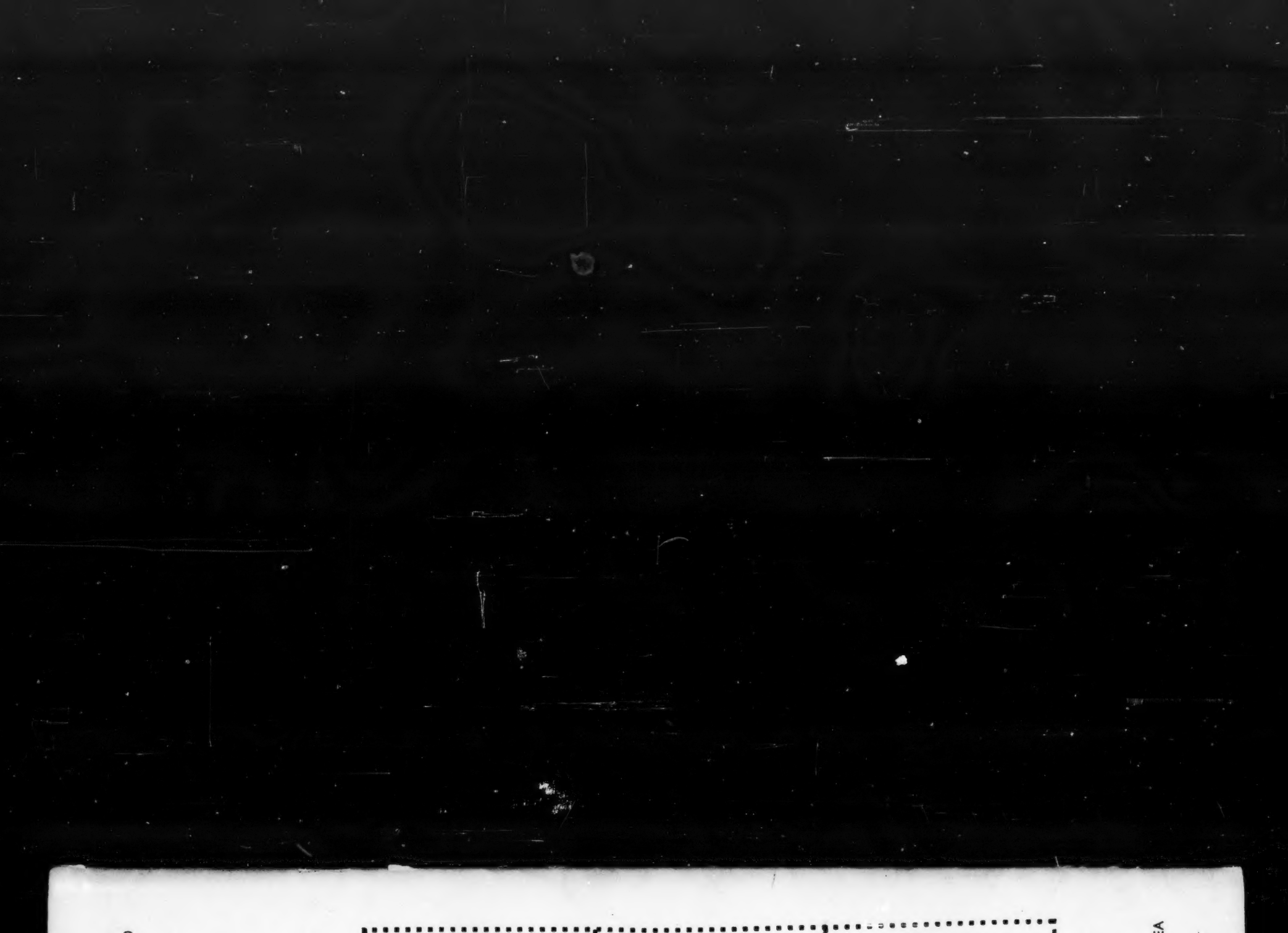
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